

Unit 2: Economic Indicators and the Business Cycle

Unit 2 covers the tools economists use to measure the economy. It covers the circular flow diagram and how GDP is measured, what GDP leaves out, how unemployment is measured and what its types are, how price indices track inflation, who gains and loses from unexpected changes in the price level, how to separate real from nominal values, and the phases of the business cycle.

AP Macroeconomics

Economic Indicators and the Business Cycle

About 12 minutes to read

How to use this guide

Read it in order the first time because the topics build on each other. GDP measurement sets up the limits of GDP, unemployment and inflation are the two indicators that define full employment and price stability, real versus nominal gives you the adjusted values you need for comparison, and the business cycle ties all three indicators together. Exam questions often give you a data table or a scenario and ask you to compute a rate or classify a situation.

After the first read, use the trap boxes and the tables to review the distinctions that exam questions test most often. 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. Economic Indicators and the Business Cycle is about 12 to 17 percent of the AP Macroeconomics exam. It also carries more weight than that number suggests, because Unit 3 constantly refers back to real GDP, unemployment, and the price level. If the indicators feel shaky now, national income and price determination will feel shaky later.

2.1 The Circular Flow and GDP

Gross domestic product (GDP) is the total market value of all final goods and services produced within a country's borders in a given time period. Each part of that definition is doing work. "Market value" means output is measured in dollars, using market prices. "Final" means only finished goods and services count, not the intermediate inputs used to make them. "Within a country's borders" means production is counted by where it happens, not by who owns the factory. "In a given time period" means only current production counts, so the resale of a used car is not in this year's GDP.

The **circular flow diagram** shows how money and resources move between sectors. Households supply factors of production (labor, land, capital, entrepreneurship) to firms and receive factor payments (wages, rent, interest, profit) in return. Firms supply finished goods and services to households and receive consumption spending in return. That is the inner loop. The government enters through taxes, transfer payments, and government purchases of goods and services. The foreign sector enters through exports and imports. Financial markets sit in the middle, collecting savings and channeling them into investment.

There are three ways to measure GDP, and they must all give the same total. The **expenditures approach** adds up spending on final goods and services: $GDP = C + I + G + X_n$. The **income approach** adds up the factor payments earned in producing output. The **value-added approach** adds up each firm's contribution, defined as its revenue minus the cost of its intermediate inputs, which avoids counting the same input twice.

COMPONENT	WHAT IT COVERS	WHAT IT EXCLUDES
C	Household spending on final goods and services, both durable and nondurable, plus services.	Used goods bought from another household.
I	Gross private domestic investment: business spending on equipment and structures, residential construction, and changes in inventories.	Purchases of stocks or bonds, which are financial transactions, not production.
G	Government purchases of goods and services at all levels of government.	Transfer payments such as Social Security or unemployment benefits, which buy no current output.
X_n	Net exports, defined as exports minus imports ($X - M$).	Imports are subtracted because C, I, and G include spending on foreign-made goods.

Leakages and injections explain how the circular flow can grow or shrink. **Leakages** are flows that leave the household-firm loop: saving, taxes, and imports. **Injectitions** are flows that enter it: investment, government purchases, and exports. When injections exceed leakages, spending and output expand. When leakages exceed injections, they contract.

Trap. Government transfer payments are not part of G. A question that lists "\$2 trillion in Social Security payments" is testing whether you know that transfers buy no current output. Only government purchases of goods and services count in GDP.

Trap. Buying stock in a company is not investment in the GDP sense. The I in $C + I + G + X_n$ means spending on newly produced capital goods, buildings, and inventory changes. Financial asset purchases just move existing claims around.

2.2 Limitations of GDP

GDP measures the market value of production, not well-being, and several important things fall outside it. **Nonmarket transactions** are the biggest category. Unpaid work such as childcare done by a parent, housework, and volunteer labor create real value but are never sold, so they never appear in GDP. The **underground economy**, meaning unreported or illegal transactions, is excluded too. So are activities with no market price at all, such as clean air or the time people spend with their families.

GDP also says nothing about distribution or quality. A country can have high GDP per capita while most of its people are poor, because GDP totals output without showing who receives it. GDP counts pollution cleanup as production but never subtracts the environmental damage that made the cleanup necessary. And GDP per capita can rise while leisure time falls, if people are simply working longer hours to produce more.

Trap. Questions about GDP limitations usually describe something valuable that has no market price and ask why GDP misses it. The answer is that GDP counts market transactions. If no money changes hands in a market, as with unpaid childcare or a favor between neighbors, GDP records nothing.

2.3 Unemployment

The **labor force** is the sum of the employed and the unemployed. The **unemployment rate** is the number of unemployed people divided by the labor force, times 100. The **labor force participation rate** is the labor force divided by the adult population, times 100. To be counted as unemployed, a person must be without a job, available for work, and actively looking for work.

Discouraged workers are people who have given up looking for work because they believe no jobs are available. They are not employed and they are not counted as unemployed. They are out of the labor force entirely, which means they shrink the denominator of the unemployment rate. During a deep recession the unemployment rate can actually understate hardship, because discouraged workers leaving the labor force hold the measured rate down.

There are three types of unemployment. **Frictional unemployment** comes from the normal process of matching workers to jobs. A new graduate searching for a first job and a worker who quit to find a better position are both frictionally unemployed. **Structural unemployment** comes from a mismatch between workers' skills and what employers need, or from workers being in the wrong place. Automation displacing factory workers and a declining industry stranding its workforce are structural. **Cyclical unemployment** comes from downturns in the business cycle. Workers laid off because a recession cut demand are cyclically unemployed, and this is the type that rises in recessions and falls in expansions.

The **natural rate of unemployment** is frictional plus structural unemployment. It is the unemployment that exists even at **full employment**, when the economy is producing at its potential. At full employment, cyclical unemployment is zero. Full employment does not mean zero unemployment. It means the only unemployment left is the frictional and structural kind that exists even in a healthy economy.

Trap. Discouraged workers are not counted as unemployed. A data question that gives you the number of discouraged workers expects you to leave them out of both the numerator and the labor force. If you add them to the unemployed, you have computed a number the exam does not recognize.

Trap. Structural unemployment is about skills and location, not about the business cycle. A worker replaced by a robot is structurally unemployed even in a boom. Cyclical unemployment is the only type tied to recessions and expansions.

2.4 Price Indices and Inflation

Inflation is a rise in the general price level over time. It is a rise in the average of prices, not a rise in any single price. **Deflation** is a fall in the general price level. **Disinflation** is a fall in the inflation rate while prices are still rising, so 8 percent inflation falling to 4 percent is disinflation, not deflation.

The **consumer price index (CPI)** measures the price of a fixed **market basket** of goods and services bought by a typical urban household. The Bureau of Labor Statistics prices the same basket each month and compares the cost to the **base year**, the reference year whose index is set to 100. The **inflation rate** from one year to the next is $(\text{CPI in the new year} - \text{CPI in the old year}) / \text{CPI in the old year} \times 100$. For example, if the CPI rises from 250 to 260, the inflation rate is $(260 - 250) / 250 \times 100$, which is 4 percent.

The CPI is not a perfect measure of the cost of living. The biggest known problem is **substitution bias**. When the price of beef rises, consumers buy more chicken, but the fixed basket keeps assuming they buy the same amount of beef. The CPI therefore overstates the increase in the cost of living, because it ignores the substitution consumers actually make. The **producer price index (PPI)** is a related measure that tracks the prices producers receive for their output, and it often moves before consumer prices do.

INDEX	WHAT IT MEASURES	KEY DETAIL
CPI	Price of a fixed basket of consumer goods and services.	Includes imports bought by households. Excludes investment goods.
GDP deflator	Price level of all domestically produced final goods and services.	Excludes imports. Includes investment goods and government purchases. Not a fixed basket.
PPI	Prices received by domestic producers.	Often an early signal of consumer price changes.

Trap. CPI and the GDP deflator react differently to the same event. A spike in the price of imported oil raises the CPI, because households buy gasoline, but it does not raise the GDP deflator, because imported oil is not domestically produced. Questions that ask which index moves are testing exactly this difference.

Trap. Disinflation is not deflation. If a question says inflation fell from 6 percent to 3 percent and asks what happened to the price level, the answer is that prices are still rising, just more slowly. Deflation means the price level itself fell.

2.5 Costs of Inflation

It is **unexpected** inflation and deflation that redistribute wealth, not the price change itself. If everyone correctly anticipates 5 percent inflation, wages, interest rates, and contracts adjust for it. When the actual rate differs from what people expected, some parties gain and others lose.

With **unexpected inflation**, borrowers gain and lenders lose. A borrower who took out a fixed-rate loan repays it in dollars that buy less than expected, so the real burden of the debt falls. The lender receives payments worth less in purchasing power than expected. Savers earning a fixed nominal interest rate lose for the same reason, and workers whose wages are fixed by contract see their real wages erode.

With **unexpected deflation**, the gains and losses reverse. Borrowers are hurt because their fixed loan payments now cost more in real terms, while lenders gain because the dollars they receive buy more than expected. Deflation also discourages spending, since consumers expect prices to keep falling and postpone purchases, which can deepen a downturn.

High or volatile inflation carries broader costs even when it is expected. **Menu costs** are the resources firms spend changing prices. **Shoe-leather costs** are the time and effort people spend managing cash to avoid holding money that loses value. And inflation uncertainty makes long-term planning harder, which can discourage the investment the economy needs to grow.

Trap. The borrower-lender result flips with deflation. Students who memorize "borrowers win" often apply it to every price change. Unexpected inflation helps borrowers and hurts lenders. Unexpected deflation hurts borrowers and helps lenders. Read the direction of the price change before assigning winners and losers.

2.6 Real vs. Nominal GDP

Nominal GDP values output at current-year prices. **Real GDP** values output at base-year prices, which removes the effect of price changes. Only real GDP lets you compare production across years, because nominal GDP can grow when nothing more is produced and prices simply rise. A **nominal variable** is measured in current dollars and a **real variable** is adjusted for changes in the price level. Real GDP is the measure used to track economic growth and to identify recessions.

The **GDP deflator** is the price index that converts between the two: $\text{GDP deflator} = (\text{nominal GDP} / \text{real GDP}) \times 100$. Rearranging gives the conversion formulas. $\text{Real GDP} = (\text{nominal GDP} / \text{GDP deflator}) \times 100$, and $\text{nominal GDP} = (\text{real GDP} \times \text{GDP deflator}) / 100$. For example, if nominal GDP is \$600 billion and real GDP is \$500 billion, the deflator is $(600 / 500) \times 100 = 120$, meaning the price level is 20 percent above the base year.

Trap. Keep the deflator formula the right way up. The deflator is nominal over real, times 100. If your computed deflator comes out below 100 when prices have risen since the base year, you have it upside down. A quick check is that the deflator equals 100 in the base year itself, because nominal and real GDP are equal there.

Trap. Rising nominal GDP does not mean the economy grew. If nominal GDP rose 6 percent while the deflator rose 6 percent, real GDP did not change at all. Any question that gives you nominal values across years and asks about growth is really asking you to deflate first.

2.7 Business Cycles

Business cycles are the recurring ups and downs of real GDP around its long-run trend. The cycle has four phases. An **expansion** is a period of rising real GDP, falling unemployment, and generally rising prices. The **peak** is the high point where the expansion ends. A **contraction**, also called a **recession**, is a period of falling real GDP, rising unemployment, and slowing inflation. The **trough** is the low point where the contraction ends and a new expansion begins.

The common rule of thumb is that a recession is two consecutive quarters of declining real GDP.

Potential output is the level of real GDP the economy produces at full employment, with unemployment at its natural rate. The **output gap** is actual real GDP minus potential output. A negative output gap means the economy is producing below potential, which happens in recessions. A positive output gap means the economy is producing above potential, which happens late in strong expansions and tends to push inflation up.

The indicators from earlier topics move together through the cycle. In an expansion, real GDP rises, cyclical unemployment falls, and inflation tends to rise as the output gap closes and turns positive. In a contraction, real GDP falls, cyclical unemployment rises, and inflation tends to ease as the output gap turns negative. Reading any one indicator in isolation is less informative than reading all three together.

Trap. The peak is not the boom and the trough is not the bust. The peak and the trough are turning points, single moments when the direction changes. The expansion and the contraction are the phases between those points. A question that asks you to identify the phase during falling output wants "contraction" or "recession," not "peak."

Confusions That Cost Points

PAIR	HOW TO KEEP THEM STRAIGHT
GDP vs GNP	GDP counts production inside the country's borders. GNP counts production by the country's residents and firms, wherever it happens. A Japanese-owned factory in Ohio adds to US GDP but not US GNP.
Final vs intermediate goods	Only final goods enter GDP. The tires sold to a carmaker are intermediate and excluded. The same tires sold to you as replacements are final and included.
Unemployed vs out of the labor force	Unemployed means jobless and actively looking. Discouraged workers and full-time students not seeking work are out of the labor force, not unemployed.
Frictional vs structural vs cyclical	Frictional is searching between jobs. Structural is a skills or location mismatch. Cyclical follows the business cycle and is zero at full employment.
CPI vs GDP deflator	CPI prices a fixed basket of consumer goods and includes imports. The deflator covers all domestic production and is not a fixed basket. Import price spikes move the CPI but not the deflator.
Inflation vs deflation vs disinflation	Inflation is rising prices. Deflation is falling prices. Disinflation is a falling inflation rate with prices still rising.
Nominal vs real GDP	Nominal uses current prices. Real uses base-year prices. Growth and recessions are judged on real GDP.
Unexpected inflation vs unexpected deflation	Unexpected inflation helps borrowers and hurts lenders. Unexpected deflation hurts borrowers and helps lenders. The winners and losers swap.
Peak and trough vs expansion and contraction	Peaks and troughs are turning points. Expansions and contractions are the phases between them.

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.** In a given year, an economy reports the following: household consumption \$9 trillion, gross private domestic investment \$3 trillion, government purchases of goods and services \$4 trillion, government transfer payments \$2 trillion, exports \$2 trillion, and imports \$3 trillion. GDP by the expenditures approach is

 1. \$15 trillion
 2. \$17 trillion
 3. \$16 trillion
 4. \$18 trillion
- 2.** An economy has an adult population of 250 million. Of these, 150 million are employed, 10 million are unemployed and actively seeking work, and 5 million are discouraged workers who have stopped looking for jobs. The unemployment rate is

 1. 6.0%
 2. 6.25%
 3. 9.4%
 4. 4.0%
- 3.** A factory worker with 20 years of experience is laid off when her employer automates the assembly line. She cannot find comparable work because her skills do not match the jobs now available in her region. She is best described as

 1. Frictionally unemployed
 2. Structurally unemployed
 3. Cyclically unemployed
 4. Not in the labor force
- 4.** The consumer price index was 240 last year and 252 this year. The inflation rate over the year was

 1. 12%
 2. 5%
 3. 4.8%
 4. 105%

5. The price of imported crude oil rises sharply. Which of the following is most likely?

1. The CPI rises and the GDP deflator rises by the same amount.
2. The CPI rises but the GDP deflator is unaffected.
3. The GDP deflator rises but the CPI is unaffected.
4. Neither the CPI nor the GDP deflator is affected.

6. In 2026, an economy's nominal GDP is \$800 billion and its real GDP, measured in base-year prices, is \$640 billion. The GDP deflator for 2026 is

1. 80
2. 125
3. 160
4. 25

7. Inflation turns out to be much higher than lenders and borrowers expected when they agreed to long-term fixed-rate loans. Which of the following is true?

1. Lenders benefit because they receive more dollars than expected.
2. Borrowers benefit because they repay their loans in dollars worth less than expected.
3. Savers with fixed nominal interest rates benefit from higher purchasing power.
4. Workers with fixed-wage contracts benefit from higher real wages.

8. An economy's actual real GDP is below its potential output, and the unemployment rate is above the natural rate. This economy is most likely in which phase of the business cycle?

1. Expansion
2. Peak
3. Contraction
4. Trough

Answer Key

- 1. A.** $GDP = C + I + G + X_n = 9 + 3 + 4 + (2 - 3) = 15$. B adds the \$2 trillion in transfer payments, which are not part of G because they buy no current output. C ignores net exports entirely and just sums $C + I + G$. D adds exports but forgets to subtract imports, counting foreign production as domestic.
- 2. B.** The labor force is employed plus unemployed: $150 + 10 = 160$ million. Discouraged workers are out of the labor force. The rate is $10 / 160 \times 100 = 6.25\%$. A puts discouraged workers in the denominator, treating them as part of the labor force. C puts them in the numerator, counting them as unemployed. D divides by the whole adult population, which is the wrong denominator.
- 3. B.** Her skills no longer match available jobs because of automation, which is a skills mismatch, the definition of structural unemployment. A is wrong because she is not voluntarily between jobs and searching normally. C is wrong because nothing in the scenario ties her layoff to a recession. D is wrong because she is still seeking work, so she remains in the labor force.
- 4. B.** The inflation rate is $(252 - 240) / 240 \times 100 = 5\%$. A reports the raw 12-point change as if it were a percent. C divides by the new CPI (252) instead of the old one. D computes $252 / 240 \times 100$, which is the new index relative to the old one, not the rate of change.
- 5. B.** Households buy gasoline made from imported oil, so the CPI rises. The GDP deflator covers only domestically produced goods, so imported oil leaves it unaffected. A ignores the difference in coverage between the two indices. C reverses the coverage. D ignores the fact that the CPI includes imported consumer goods.
- 6. B.** The GDP deflator is $(\text{nominal GDP} / \text{real GDP}) \times 100 = (800 / 640) \times 100 = 125$. A flips the fraction and computes real over nominal. C has no basis in the formula. D computes the percentage gap between the two GDP figures, which is not an index value.
- 7. B.** Unexpected inflation lets borrowers repay fixed-rate loans in dollars worth less than expected, so borrowers gain and lenders lose. A is wrong because receiving more dollars is not a gain when each dollar buys less. C is wrong because a fixed nominal return loses purchasing power under unexpected inflation. D is wrong because fixed nominal wages buy less, so real wages fall.
- 8. C.** Output below potential with unemployment above the natural rate is the signature of a contraction. A and B describe an economy at or above potential. D is the turning point at the bottom, not the phase of declining output described here.

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 Economic Indicators 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 Economic Indicators and the Business Cycle deck and let spaced review bring them back over the next few days.

- State the definition of GDP and explain what each qualifier (market value, final, within borders, time period) excludes.
- Write $GDP = C + I + G + X_n$ and describe what belongs in each component and what does not.
- Name the three approaches to measuring GDP and explain why they give the same total.
- Identify leakages and injections in the circular flow and explain what happens when injections exceed leakages.
- Give three reasons GDP is a limited measure of well-being.
- Write the unemployment rate and labor force participation rate formulas, and explain where discouraged workers go.
- Distinguish frictional, structural, and cyclical unemployment with an example of each.
- Define the natural rate of unemployment and explain what it equals at full employment.
- Write the inflation rate formula and compute it from two CPI values.
- Explain substitution bias and why the CPI overstates the cost of living.
- Explain how an import price spike moves the CPI and the GDP deflator differently.
- State who gains and who loses from unexpected inflation, and how unexpected deflation reverses it.
- Write the GDP deflator formula and use it to convert between nominal and real GDP.
- Name the four business cycle phases in order and define potential output and the output gap.

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 Economic Indicators and the Business Cycle 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.

Key terms for this unit

Gross domestic product (GDP), Circular flow diagram, Expenditures approach, Income approach, Value-added approach, Leakages, Injections, Nonmarket transactions, Labor force, Unemployment rate, Labor force participation rate, Discouraged workers, Frictional unemployment, Structural unemployment, Cyclical unemployment, Natural rate of unemployment, Full employment, Consumer price index (CPI), Base year, Market basket, Inflation, Deflation, Disinflation, Inflation rate, Substitution bias, Producer price index (PPI), GDP deflator, Nominal GDP, Real GDP, Costs of unexpected inflation, Costs of unexpected deflation, Menu costs, Business cycles, Expansion, Peak, Contraction (recession), Trough, Potential output, Output gap.

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