

AP MACROECONOMICS STUDY GUIDE

181 High-Yield Concepts

Advanced Placement Course | College Board CED-aligned

- All 6 CED units: foundations, indicators, AD-AS, the financial sector, long-run, and the open economy
 - Every formula: multipliers, CPI, GDP, Phillips curve, Fisher, $MV = PQ$, and the Rule of 70
 - Exam weights on every unit; real exam format on the how-to page
 - Perfect for the AP Macroeconomics exam in May

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How to Use This Guide

This guide condenses the AP Macroeconomics course and exam description into high-yield concepts. It is not a textbook replacement -- it is the fastest way to review everything the exam covers and to target your weak units.

The AP Macro exam is 2 hours 10 minutes: 60 multiple-choice questions (70 min, 66.65% of the score) and 3 free-response questions (60 min, 33.35% of the score). The 6 units below map to the College Board Course and Exam Description, with unit weights on each section title.

How to use the concepts

- Each concept = term + concise explanation + high-yield exam tip (+ example where useful).
- First pass: read every concept in order. Underline anything unfamiliar.
- Second pass: focus only on the concepts you underlined.
- Two weeks before the exam: rapid-review every tip line (they are the highest-yield).
- Use the Table of Contents to jump straight to your weakest units.

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Total: 181 high-yield concepts

How to use the TOC: work through the units in order on your first pass, then jump back to your weakest units for review. Each concept includes an Explanation, a high-yield exam tip, and where useful an Example. Mark the concepts you miss with a small dot in the margin and revisit them 48 hours later.

Unit 1: Unit 1: Basic Economic Concepts

12-15% of the AP Macro exam. Scarcity, opportunity cost, supply and demand, and the foundations of economic thinking.

1 Scarcity & Choice

Explanation: Scarcity means society has limited resources (land, labor, capital, entrepreneurship) but unlimited wants. Because of scarcity, every decision involves a choice among alternatives.

AP Macro Tip: *Scarcity is the starting point of ALL economics -- the exam expects you to identify it as the reason choices exist.*

Example: Even a wealthy country faces scarcity: it cannot produce unlimited healthcare AND unlimited defense with the same resources.

2 Opportunity Cost

Explanation: The value of the next-best alternative given up when a choice is made. It applies to individuals, firms, and governments -- every choice has one.

AP Macro Tip: *Opportunity cost = the NEXT BEST alternative forgone, not all alternatives. Calculate it from a PPC or a table.*

Example: If you spend \$20 and 3 hours at a concert, the opportunity cost includes the savings and the hours you could have worked.

3 Marginal Analysis

Explanation: Decision-making by comparing marginal (additional) benefit to marginal cost. Act if $MB > MC$. This is the logic behind most rational choice.

AP Macro Tip: *Marginal = additional. The exam tests 'should I do one more?' decisions and the $MB = MC$ rule.*

Example: A firm hires another worker only if the extra output (marginal product) adds more revenue than the extra wage.

4 The Production Possibilities Curve (PPC)

Explanation: The PPC shows the maximum combinations of two goods an economy can produce with full employment of resources and fixed technology. Points on the curve are efficient; inside is inefficient; outside is unattainable.

AP Macro Tip: *PPC = trade-offs and opportunity cost. Bowed-out = increasing opportunity cost; straight line = constant cost.*

Example: An economy producing 100 guns and 50 butter on the PPC cannot produce 110 guns and 50 butter without more resources or technology.

5 Economic Growth & the PPC

Explanation: Economic growth shifts the PPC outward. It comes from more resources, better technology, or increased productivity. A single good's expansion shifts the axis (a 'pivot').

AP Macro Tip: *Growth = PPC shifts OUT. Identify what causes it: capital investment, labor growth, technology, education.*

Example: Investing in new factories today shifts the PPC outward tomorrow -- at the cost of current consumption.

6 Comparative Advantage & Specialization

Explanation: An individual or country has a comparative advantage in producing the good with the lower opportunity cost. Specializing according to comparative advantage and trading increases total output for both parties.

AP Macro Tip: *Comparative advantage = LOWER opportunity cost (not lower absolute cost). The exam makes you calculate opportunity costs from tables.*

Example: If the US gives up 2 TVs per car and Japan gives up 3 TVs per car, the US has the comparative advantage in cars.

7 Absolute Advantage

Explanation: The ability to produce MORE of a good with the same resources (or the same amount with fewer resources). It is about output per input, not opportunity cost.

AP Macro Tip: *Absolute advantage = more output; comparative advantage = lower opportunity cost. Trade is based on COMPARATIVE advantage.*

Example: If Mexico grows 10 tons of corn per acre and Canada grows 6, Mexico has the absolute advantage in corn.

8 Terms of Trade

Explanation: The rate at which countries exchange goods -- the price of one good in terms of another. Mutually beneficial terms fall between the two countries' opportunity costs.

AP Macro Tip: *Terms of trade must lie BETWEEN the two opportunity costs for trade to benefit both parties.*

Example: If US cars cost 2 TVs and Japan cars cost 3 TVs, any trade price between 2 and 3 TVs per car benefits both.

9 The Law of Demand

Explanation: As price falls, quantity demanded rises (and vice versa), holding everything else constant. The demand curve slopes downward.

AP Macro Tip: *Demand = price vs quantity, ceteris paribus. Distinguish a MOVEMENT along demand (price change) from a SHIFT (other factor).*

Example: When the price of coffee falls, buyers purchase more coffee -- a movement along the demand curve.

10 Shifters of Demand

Explanation: Demand shifts when tastes, income, prices of related goods (substitutes/complements), expectations, or the number of buyers change. Increase in demand shifts the curve right.

AP Macro Tip: *Remember the shifters: tastes, income, related goods, expectations, buyers. A price change NEVER shifts demand.*

Example: Higher consumer income raises demand for normal goods (right shift) and lowers demand for inferior goods (left shift).

11 The Law of Supply

Explanation: As price rises, quantity supplied rises (and vice versa), holding everything else constant. The supply curve slopes upward.

AP Macro Tip: *Supply = price vs quantity, ceteris paribus. Price changes move ALONG supply; other factors SHIFT it.*

Example: Higher wheat prices lead farmers to plant more wheat -- a movement along the supply curve.

12 Shifters of Supply

Explanation: Supply shifts when input prices, technology, expectations, taxes/subsidies, or the number of sellers change. Lower input costs shift supply right.

AP Macro Tip: *Supply shifters: inputs, technology, expectations, taxes/subsidies, sellers. Technology improvements always shift supply RIGHT.*

Example: A new fertilizer that raises yield per acre shifts the supply of corn to the right.

13 Market Equilibrium

Explanation: Equilibrium is where quantity demanded equals quantity supplied; the equilibrium price clears the market. At that price there is no surplus or shortage.

AP Macro Tip: *Equilibrium = $Q_d = Q_s$. Find it where the demand and supply curves cross; identify it on a graph.*

Example: If a market clears at \$5 with 100 units traded, \$5 is the equilibrium price.

14 Surplus & Shortage

Explanation: A surplus occurs when price is above equilibrium ($Q_s > Q_d$); a shortage when price is below ($Q_d > Q_s$). Prices adjust to eliminate both.

AP Macro Tip: *Above equilibrium = surplus; below = shortage. Know the price-adjustment process.*

Example: A price floor above equilibrium creates a surplus of unsold goods -- e.g., a minimum wage above market clears the labor market slowly.

15 Price Ceilings

Explanation: A legal maximum price (e.g., rent control). A binding ceiling below equilibrium creates a shortage, and often black markets, reduced quality, and misallocation.

AP Macro Tip: *Binding price ceiling = below equilibrium -> shortage. Nonbinding = above equilibrium -> no effect.*

Example: Rent control in New York keeps rents below market, creating long waiting lists and landlord disinvestment.

16 Price Floors

- Explanation:** A legal minimum price (e.g., minimum wage, agricultural supports). A binding floor above equilibrium creates a surplus.
- AP Macro Tip:** *Binding price floor = above equilibrium → surplus. Minimum wage above market wage causes unemployment (a labor surplus).*
- Example:** A minimum wage set above the equilibrium wage reduces the quantity of labor demanded, causing unemployment.
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17 Price Elasticity of Demand

- Explanation:** The responsiveness of quantity demanded to a price change. Elastic ($|E| > 1$): quantity changes more than price. Inelastic ($|E| < 1$): quantity changes less. Unit elastic = 1.
- AP Macro Tip:** *Elasticity = %change in Qd / %change in P. Demand is more elastic with more substitutes, longer time horizons, and larger budget shares.*
- Example:** Gasoline demand is inelastic in the short run (few substitutes) but more elastic over time.
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18 Price Elasticity of Supply

- Explanation:** The responsiveness of quantity supplied to price. Supply is elastic when firms can adjust production easily (long run, spare capacity) and inelastic when they cannot (short run, fixed capacity).
- AP Macro Tip:** *Supply elasticity depends on time and flexibility. Long-run supply is more elastic than short-run supply.*
- Example:** Beachfront land supply is perfectly inelastic; manufactured goods supply is elastic over time.
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19 Consumer Surplus

- Explanation:** The difference between what buyers are willing to pay and what they actually pay -- the benefit consumers receive from trade. It is the area below demand and above price.
- AP Macro Tip:** *Consumer surplus = area under demand, above the price line. It falls when price rises.*
- Example:** If you would pay \$50 for a jacket but pay \$30, your consumer surplus is \$20.
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20 Producer Surplus

- Explanation:** The difference between the price sellers receive and their minimum acceptable price (marginal cost) -- the benefit producers receive. It is the area above supply and below price.
- AP Macro Tip:** *Producer surplus = area above supply, below the price line. It falls when price falls.*
- Example:** A farmer who would sell wheat at \$4 but receives \$6 earns \$2 of producer surplus per bushel.
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21 Total Surplus & Efficiency

- Explanation:** Total surplus = consumer + producer surplus. Markets are efficient (maximize total surplus) at equilibrium -- no deadweight loss.
- AP Macro Tip:** *Efficiency = equilibrium; total surplus is maximized where MB = MC (demand = supply).*
- Example:** At equilibrium, every mutually beneficial trade has occurred -- total surplus is at its maximum.
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22 Deadweight Loss

- Explanation:** The loss of total surplus when a market is not at equilibrium (price controls, taxes, monopoly). It measures the trades that no longer happen.
- AP Macro Tip:** *Deadweight loss = lost surplus from inefficiency. Taxes and price controls create it; equilibrium eliminates it.*
- Example:** A tax on a good raises price and lowers quantity, destroying some trades that would have benefited both sides.
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23 The Circular Flow Model

- Explanation:** A model of the economy showing households supplying resources (labor) and demanding goods, and firms demanding resources and supplying goods. Money flows from households to firms in product markets and back in resource markets.
- AP Macro Tip:** *Circular flow = households (resource owners) and firms (producers), connected by product and resource markets. Know the two flows (goods/services and money).*
- Example:** When you buy a coffee, money flows through the product market to the firm, which pays wages through the resource market.
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24 The Factors of Production

Explanation: The inputs used to produce goods: land (natural resources), labor (human effort), capital (machines, tools, factories), and entrepreneurship. Their payments are rent, wages, interest, and profit.

AP Macro Tip: *Factors = land, labor, capital, entrepreneurship. Match each to its factor payment.*

Example: A factory's robotic welders are capital; the workers operating them are labor; the founder's vision is entrepreneurship.

25 Positive vs Normative Economics

Explanation: Positive statements describe what IS and can be tested ('inflation is 3%'). Normative statements express what SHOULD BE and involve value judgments ('inflation should be lower').

AP Macro Tip: *Positive = factual/testable; normative = opinion. The exam makes you classify statements.*

Example: 'Raising the minimum wage reduces employment' is positive; 'the minimum wage should be raised' is normative.

26 Microeconomics vs Macroeconomics

Explanation: Microeconomics studies individual markets, firms, and households. Macroeconomics studies the whole economy: growth, inflation, unemployment, and aggregate demand/supply.

AP Macro Tip: *Macro = the big picture (GDP, inflation, unemployment); micro = individual markets. AP Macro focuses on the former.*

Example: A firm's pricing decision is micro; the national unemployment rate is macro.

27 The Economic Problem & Resource Allocation

Explanation: Every economy must answer: what to produce, how to produce it, and for whom. Market economies use prices; command economies use central planning; mixed economies combine both.

AP Macro Tip: *The three questions (what/how/for whom) frame all economic systems; the US is a mixed market economy.*

Example: In a market economy, prices allocate resources to the highest-value uses -- no central planner needed.

28 The Price System & the Invisible Hand

Explanation: Adam Smith's 'invisible hand': individuals pursuing their own interest promote society's interest, coordinated by prices. Markets signal scarcity and allocate resources without central direction.

AP Macro Tip: *The invisible hand = self-interest + prices -> social benefit. It is the intellectual foundation of market economics.*

Example: A drought raises grain prices, signaling farmers to grow more and consumers to waste less -- no one directed it.

29 Government Intervention Overview

Explanation: Governments intervene to fix market failures and pursue equity: price controls, taxes, subsidies, regulation, and public provision. Interventions can create inefficiency (deadweight loss).

AP Macro Tip: *Intervention = correction for market failure OR source of inefficiency. Evaluate each policy's winners and losers.*

Example: A subsidy for solar panels corrects the positive externality of clean energy but costs taxpayers.

30 The Business Cycle (Preview)

Explanation: The economy fluctuates through expansion, peak, contraction (recession), and trough. Macro policy aims to smooth these fluctuations.

AP Macro Tip: *The cycle = expansion -> peak -> contraction -> trough. Identify where the economy is from output data.*

Example: A recession is defined as two consecutive quarters of falling real GDP -- a contraction phase.

31 The GDP Definition (Preview)

Explanation: Gross Domestic Product is the total market value of all final goods and services produced within a country in a year. It measures economic activity and living standards.

AP Macro Tip: *GDP = final goods only, produced within borders, in a year. Exclude intermediate goods and secondhand sales.*

Example: A used car sale is NOT counted in GDP (it was counted when first sold); a new car sale is.

Unit 2: Unit 2: Economic Indicators & the Business Cycle

20-25% of the AP Macro exam. GDP, unemployment, inflation, and how we measure the macroeconomy.

32 Gross Domestic Product (GDP)

Explanation: The market value of all final goods and services produced within a country in a given period. It is the headline measure of economic output.

AP Macro Tip: GDP counts FINAL goods produced WITHIN a country's borders. Learn the exclusions: intermediate goods, secondhand sales, financial transactions, nonmarket activity.

Example: If a US-owned factory in Mexico produces cars, that output counts in Mexico's GDP, not the US's.

33 The Expenditure Approach: $C + I + G + X_n$

Explanation: GDP = Consumption + Investment + Government Purchases + Net Exports (exports - imports). Each component corresponds to a sector of spending.

AP Macro Tip: Memorize $C + I + G + X_n$. Identify which component a scenario falls into.

Example: A family's grocery bill is Consumption; a firm's new machine is Investment; a soldier's salary is Government purchases.

34 The Income Approach

Explanation: GDP can also be measured by adding up all incomes: wages, rents, interest, and profits (plus taxes minus subsidies). The two approaches yield the same total.

AP Macro Tip: Expenditure = income because every dollar spent becomes someone's income. Know both approaches exist.

Example: National income accounting adds up wages + rent + interest + profit to match spending.

35 Real vs Nominal GDP

Explanation: Nominal GDP uses current prices; real GDP uses constant (base-year) prices, removing inflation. Real GDP is the true measure of output growth.

AP Macro Tip: Real GDP = output adjusted for inflation. Nominal GDP can rise from prices alone.

Example: If prices double but output is flat, nominal GDP doubles while real GDP is unchanged.

36 The GDP Deflator

Explanation: The GDP deflator = $(\text{Nominal GDP} / \text{Real GDP}) \times 100$. It measures the overall price level of all goods produced domestically.

AP Macro Tip: GDP deflator = the broad price index from GDP data. Use it to convert nominal to real.

Example: If nominal GDP is \$110 and real GDP is \$100, the deflator is 110 -- prices rose 10%.

37 The Business Cycle: Phases

Explanation: The business cycle: expansion (growth), peak (top), contraction/recession (decline), trough (bottom). Recessions are marked by falling real GDP, rising unemployment.

AP Macro Tip: Identify the phase from output data: rising = expansion; falling = recession. The peak and trough are turning points.

Example: From 2007-2009 the US economy contracted -- the trough arrived in mid-2009.

38 The Unemployment Rate

Explanation: Unemployment rate = $(\text{number unemployed} / \text{labor force}) \times 100$. The labor force includes employed plus unemployed people actively seeking work.

AP Macro Tip: Unemployment rate = unemployed / labor force (not total population). The labor force excludes discouraged workers.

Example: If 10 people are unemployed and 90 employed, the unemployment rate is 10%.

39 The Labor Force Participation Rate

Explanation: Labor force participation rate = (labor force / working-age population) x 100. It measures the share of adults in the labor market.

AP Macro Tip: *Participation rate = LF / adult population. It fell after 2008 and during COVID -- people left the labor force.*

Example: If 150 million adults work or seek work out of 250 million adults, participation is 60%.

40 Frictional Unemployment

Explanation: Short-term unemployment from the normal job-search process: people between jobs, new graduates, voluntary quits. It is always present and not a policy problem.

AP Macro Tip: *Frictional = between jobs/searching; it is natural and even healthy for the economy.*

Example: A nurse who quits to relocate to another city is frictionally unemployed while searching.

41 Structural Unemployment

Explanation: Long-term unemployment from a mismatch of skills and jobs: workers lack the skills employers need, or jobs have moved away. It persists and requires retraining or relocation.

AP Macro Tip: *Structural = skills/geography mismatch. It is the most painful form and raises the natural rate.*

Example: Coal miners in a region where mines closed face structural unemployment unless they retrain.

42 Cyclical Unemployment

Explanation: Unemployment caused by the business cycle -- the shortfall of jobs during recessions when aggregate demand is low. It is the target of stabilization policy.

AP Macro Tip: *Cyclical = recession unemployment. It rises in contractions and falls in expansions; it is the deviation from the natural rate.*

Example: Layoffs at automakers during the 2008 recession were cyclical unemployment.

43 The Natural Rate of Unemployment

Explanation: The unemployment rate at full employment: frictional + structural. It exists even when the economy is healthy; the cyclical component is zero at the natural rate.

AP Macro Tip: *Natural rate = frictional + structural. Cyclical = actual - natural. Full employment does NOT mean zero unemployment.*

Example: If the natural rate is 5% and actual unemployment is 7%, cyclical unemployment is 2%.

44 Discouraged Workers & Underemployment

Explanation: Discouraged workers have stopped searching and drop out of the labor force (not counted as unemployed). Underemployment includes part-time workers who want full-time work and overqualified workers.

AP Macro Tip: *Discouraged workers are NOT in the labor force -- they make the unemployment rate look lower than it is.*

Example: After a long search fails, a worker stops applying: counted as out of the labor force, not unemployed.

45 Inflation & the Price Level

Explanation: Inflation is a sustained rise in the overall price level; it erodes purchasing power. Deflation is a sustained fall; disinflation is a slowdown in the inflation rate.

AP Macro Tip: *Inflation = rising price level. Deflation and disinflation are different -- know the distinction.*

Example: If the CPI rises from 100 to 110, the price level rose 10% -- that is inflation.

46 The Consumer Price Index (CPI)

Explanation: CPI measures the cost of a fixed basket of goods and services bought by a typical urban consumer, relative to a base year. It is the most cited inflation measure.

AP Macro Tip: *CPI = fixed basket price today / basket price in base year x 100. Inflation rate = % change in CPI.*

Example: If the CPI basket costs \$100 in the base year and \$115 now, the CPI is 115 -- 15% inflation since base year.

47 CPI vs GDP Deflator

Explanation: CPI uses a fixed basket of consumer goods (including imports) and measures consumer prices. The GDP deflator covers all domestically produced goods and adjusts the basket as output changes.

AP Macro Tip: *CPI = consumers + imports, fixed basket; deflator = domestic output, flexible basket. Imported goods raise CPI but not the deflator.*

Example: A surge in imported oil prices raises the CPI but not the GDP deflator (imports are not domestic output).

48 Real vs Nominal Interest Rates

Explanation: The nominal interest rate is the stated rate. The real rate = nominal - expected inflation. Real rates matter for borrowing and investing decisions.

AP Macro Tip: *Real = nominal - inflation. Lenders and borrowers respond to REAL rates.*

Example: If the nominal rate is 8% and inflation is 3%, the real interest rate is 5%.

49 The Fisher Effect

Explanation: The Fisher equation: nominal interest rate = real rate + expected inflation. When expected inflation rises, nominal rates rise one-for-one, leaving real rates unchanged.

AP Macro Tip: *Fisher: $i = r + \text{expected inflation}$. Higher expected inflation $\rightarrow$ higher nominal rates.*

Example: If inflation expectations rise from 2% to 4%, nominal loan rates rise by about 2 percentage points.

50 The Costs of Inflation

Explanation: Inflation hurts: creditors (fixed-rate loans repaid in cheaper dollars), savers (eroded purchasing power), and those on fixed incomes. It creates menu costs, shoe-leather costs, and tax distortions.

AP Macro Tip: *Inflation redistributes wealth from lenders to borrowers and punishes cash savers. Unexpected inflation is especially costly.*

Example: A retiree on a fixed pension loses purchasing power when inflation is higher than expected.

51 Hyperinflation & Stagflation

Explanation: Hyperinflation is extremely rapid inflation that destroys money's value (e.g., Zimbabwe, Weimar Germany). Stagflation = high inflation + high unemployment + stagnant output, as in the 1970s.

AP Macro Tip: *Hyperinflation = runaway prices from excessive money creation; stagflation = inflation + recession together.*

Example: Zimbabwe's 2008 inflation reached billions of percent; the 1970s US suffered stagflation from oil shocks.

52 Okun's Law

Explanation: Okun's law relates unemployment to output: for every 1 percentage point that unemployment exceeds the natural rate, real GDP falls about 2% below potential.

AP Macro Tip: *Okun's law = the 2:1 link between unemployment and the output gap. Use it to estimate GDP loss in a recession.*

Example: If unemployment is 3 points above the natural rate, output is roughly 6% below potential.

53 The Output Gap

Explanation: The output gap = actual output minus potential output. A recessionary (negative) gap means unemployment above natural; an inflationary (positive) gap means unemployment below natural.

AP Macro Tip: *Output gap = actual - potential. Negative gap = recessionary; positive gap = inflationary.*

Example: If the economy produces \$18T but potential is \$20T, there is a \$2T recessionary gap.

54 Leading, Coincident & Lagging Indicators

Explanation: Leading indicators (stock prices, building permits, new orders) forecast the economy. Coincident indicators (employment, production) move with it. Lagging indicators (unemployment duration, inventories) follow it.

AP Macro Tip: *Match indicators to their timing: leading predicts, coincident reflects, lagging confirms.*

Example: A surge in building permits (leading) suggests future construction and growth.

55 The Quantity Theory of Money (Preview)

Explanation: $MV = PQ$: money supply times velocity equals price level times real output. It links money growth to inflation in the long run.

AP Macro Tip: $MV = PQ$ is the framework for the long-run link between money and prices.

Example: If the Fed doubles the money supply and velocity and output are stable, prices double in the long run.

56 The Wage-Price Spiral

Explanation: A self-reinforcing cycle: higher prices → workers demand higher wages → firms raise prices to cover costs → prices rise further. It explains persistent inflation once expectations adapt.

AP Macro Tip: The spiral = prices and wages chasing each other; anchored expectations break it.

Example: In the 1970s, union contracts with cost-of-living adjustments fed the inflation spiral.

57 The Inflation Rate Calculation

Explanation: Inflation rate = $((\text{CPI this year} - \text{CPI last year}) / \text{CPI last year}) \times 100$. Always compare the same index across two periods.

AP Macro Tip: Inflation = % change in the price index. Practice the formula with CPI numbers.

Example: If CPI rises from 100 to 105, the inflation rate is 5%.

58 Deflation & Its Dangers

Explanation: Deflation (falling prices) sounds good but is dangerous: consumers delay purchases (waiting for lower prices), real debt burdens rise, and the economy can stall in a deflationary trap.

AP Macro Tip: Deflation = falling prices → delayed spending → recession. It is a policy nightmare for central banks.

Example: Japan's 'lost decades' illustrate how persistent deflation suppresses consumption and investment.

59 Shoe-Leather & Menu Costs

Explanation: Shoe-leather costs: the time and effort spent economizing on cash during inflation. Menu costs: the cost of changing prices frequently. Both are inefficiencies of inflation.

AP Macro Tip: Shoe-leather = running around to avoid cash; menu = cost of repricing. Name both in inflation-cost questions.

Example: During high inflation, firms repaint prices weekly and people rush to spend cash before it loses value.

60 Real GDP per Capita & Living Standards

Explanation: Real GDP per capita (real GDP divided by population) is the best single measure of average material living standards. Growth in it drives long-run prosperity.

AP Macro Tip: Per capita real GDP = output per person. Use it to compare living standards across countries and time.

Example: Country A's real GDP per capita of \$60,000 vs Country B's \$5,000 indicates far higher average living standards.

61 Limitations of GDP

Explanation: GDP misses: nonmarket production (housework, volunteering), the underground economy, leisure, income distribution, and environmental damage. High GDP does not equal well-being.

AP Macro Tip: GDP is a measure of output, NOT welfare. List what it excludes for 'limitations of GDP' questions.

Example: GDP excludes unpaid childcare and ignores pollution -- a country can grow GDP while degrading its environment.

Unit 3: Unit 3: National Income & Price Determination

17-22% of the AP Macro exam. Aggregate demand, aggregate supply, and the AD-AS model.

62 Aggregate Demand (AD)

Explanation: AD = total spending in the economy at each price level: $C + I + G + X_n$. The AD curve slopes downward because of the wealth, interest-rate, and international effects.

AP Macro Tip: $AD = C + I + G + X_n$ at every price level. It slopes down for three reasons -- know all three.

Example: A lower price level raises the real value of money balances, increasing consumption -- the wealth effect.

63 The Wealth Effect

Explanation: A fall in the price level raises the real value of money and assets, making households feel wealthier and spend more. This is one reason AD slopes downward.

AP Macro Tip: *Wealth effect: lower prices -> more real wealth -> more consumption.*

Example: If prices fall 10%, a \$10,000 bank account buys more -- households spend more.

64 The Interest Rate Effect

Explanation: A lower price level reduces money demand, lowering interest rates, which boosts investment and interest-sensitive consumption. Another reason AD slopes downward.

AP Macro Tip: *Lower price level -> lower interest rates -> more investment. Chain the logic for graph questions.*

Example: Falling prices free up cash, pushing rates down and making new equipment purchases cheaper to finance.

65 The International Trade Effect

Explanation: A lower domestic price level makes domestic goods cheaper relative to foreign goods, raising net exports. This reinforces the downward slope of AD.

AP Macro Tip: *Lower domestic prices -> more exports, fewer imports -> higher X_n .*

Example: If US prices fall while European prices hold, US goods become more attractive abroad -- exports rise.

66 Shifters of Aggregate Demand

Explanation: AD shifts right when C , I , G , or X_n rise: consumer confidence, wealth, tax cuts, business optimism, government spending, foreign income, or a weaker dollar.

AP Macro Tip: *Anything that raises C , I , G , or X_n shifts AD right. Tax policy and expectations are favorite exam scenarios.*

Example: A tax cut raises disposable income, shifting AD right.

67 Short-Run Aggregate Supply (SRAS)

Explanation: SRAS shows the total output firms produce at each price level in the short run. It slopes upward because higher prices raise profit margins as nominal wages lag.

AP Macro Tip: *SRAS = upward sloping. Output rises with the price level when input costs are sticky.*

Example: If prices rise but wages are fixed by contract, profits rise and firms produce more.

68 Why SRAS Slopes Upward

Explanation: In the short run, input prices (especially wages) are sticky. When output prices rise faster than input costs, profit margins widen, so firms expand production.

AP Macro Tip: *Sticky wages -> rising profits -> more output. This is the core explanation for SRAS's slope.*

Example: A bakery's bread prices rise 10% while flour contracts hold -- it bakes more loaves.

69 Shifters of SRAS

Explanation: SRAS shifts right when input prices fall, productivity rises, or taxes/regulations fall. Left shifts come from higher input costs (oil shocks) or supply disruptions.

AP Macro Tip: *Input prices, productivity, and supply shocks move SRAS. An oil price spike shifts SRAS left (stagflation).*

Example: A plunge in oil prices cuts production costs everywhere -- SRAS shifts right, prices fall, output rises.

70 Long-Run Aggregate Supply (LRAS)

Explanation: LRAS is vertical at potential (full-employment) output: in the long run, the economy produces at its natural level regardless of the price level. It shifts with resources and technology.

AP Macro Tip: *LRAS = vertical at potential GDP. The economy self-corrects to LRAS in the long run.*

Example: Better technology shifts LRAS right -- potential output grows even though the price level is irrelevant to it.

71 Macroeconomic Equilibrium (Short Run)

Explanation: Short-run equilibrium is where AD meets SRAS, determining the price level and real GDP. The economy can be in equilibrium below, at, or above potential.

AP Macro Tip: *Find short-run equilibrium at $AD = SRAS$. Compare it to LRAS to identify the output gap.*

Example: If AD and SRAS cross below LRAS, the economy is in a recessionary gap.

72 The Recessionary Gap

Explanation: When short-run equilibrium output is below potential ($AD = SRAS$ below LRAS), there is a recessionary (contractionary) gap and cyclical unemployment.

AP Macro Tip: *Recessionary gap = output < potential. Fix it with expansionary policy or self-correction.*

Example: In 2009 the US output gap was deeply negative -- millions unemployed below potential.

73 The Inflationary Gap

Explanation: When equilibrium output exceeds potential ($AD = SRAS$ above LRAS), there is an inflationary (expansionary) gap, with unemployment below the natural rate and upward price pressure.

AP Macro Tip: *Inflationary gap = output > potential. It is unsustainable and leads to rising prices.*

Example: An economy producing 3% above potential with unemployment at 2% has an inflationary gap.

74 Full-Employment Equilibrium

Explanation: When $AD = SRAS = LRAS$, the economy is at full employment: no cyclical unemployment, output at potential, and prices stable.

AP Macro Tip: *Full employment = equilibrium ON the LRAS line. The natural rate of unemployment still exists.*

Example: An economy at full employment still has frictional and structural unemployment -- just no cyclical.

75 The Multiplier Effect

Explanation: An initial change in spending (I, G, or X_n) causes a larger final change in GDP because each round of spending becomes income for someone else.

AP Macro Tip: *Multiplier = change in GDP / change in spending. It amplifies any autonomous spending change.*

Example: A \$100 billion infrastructure program ultimately raises GDP by more than \$100 billion.

76 The Spending Multiplier Formula

Explanation: Multiplier = $1 / (1 - MPC) = 1 / MPS$. With $MPC = 0.8$, the multiplier is 5 -- a \$100B spending increase raises GDP by \$500B.

AP Macro Tip: *Multiplier = $1/(1-MPC) = 1/MPS$. Higher MPC -> bigger multiplier. Memorize both forms.*

Example: If the MPC is 0.9, the multiplier is 10 -- nearly all of each dollar is re-spent.

77 Marginal Propensity to Consume (MPC)

Explanation: MPC = the fraction of each additional dollar of income that is spent on consumption. $MPC = \text{change in consumption} / \text{change in income}$.

AP Macro Tip: $MPC + MPS = 1$. MPC feeds directly into the multiplier formula.

Example: If a \$1,000 raise leads to \$750 more spending, $MPC = 0.75$ and $MPS = 0.25$.

78 Marginal Propensity to Save (MPS)

Explanation: MPS = the fraction of each additional dollar of income saved. $MPS = \text{change in saving} / \text{change in income} = 1 - MPC$.

AP Macro Tip: $MPS = 1 - MPC$. The multiplier is $1/MPS$ -- a higher saving rate means a smaller multiplier.

Example: If households save \$250 of every \$1,000, $MPS = 0.25$ and the multiplier is 4.

79 The Tax Multiplier

Explanation: The tax multiplier = $-MPC / (1 - MPC) = -MPC / MPS$. It is smaller (in absolute value) than the spending multiplier because part of a tax cut is saved.

AP Macro Tip: Tax multiplier is NEGATIVE and smaller than the spending multiplier. Tax cuts boost GDP by less than spending.

Example: With $MPC = 0.8$, a \$100B tax cut raises GDP by \$400B, while \$100B spending raises it \$500B.

80 The Consumption Function

Explanation: $C = \text{autonomous consumption} + MPC \times \text{disposable income}$. It shows consumption rising with income, with a slope equal to the MPC.

AP Macro Tip: Consumption function: $C = a + bY_d$. The slope is the MPC; a is spending with zero income.

Example: If $C = 100 + 0.8Y_d$, a household with \$1,000 income consumes \$900.

81 Autonomous vs Induced Spending

Explanation: Autonomous spending does not depend on income (government purchases, basic consumption). Induced spending varies with income (consumption driven by income). Only autonomous changes create multiplier effects.

AP Macro Tip: The multiplier applies to CHANGES in autonomous spending (I, G, X_n).

Example: A new highway (G) is autonomous spending; grocery spending that rises with income is induced.

82 Expansionary Fiscal Policy

Explanation: When the economy is in a recessionary gap, the government increases spending or cuts taxes to shift AD right, raising output toward potential.

AP Macro Tip: Expansionary fiscal = more G or lower taxes -> AD right. Use it for recessionary gaps.

Example: The 2009 American Recovery and Reinvestment Act used spending and tax cuts to fight the recession.

83 Contractionary Fiscal Policy

Explanation: When the economy is in an inflationary gap, the government cuts spending or raises taxes to shift AD left, cooling the economy and price level.

AP Macro Tip: Contractionary fiscal = less G or higher taxes -> AD left. Use it for inflationary gaps.

Example: Raising income taxes during a boom reduces consumption and inflationary pressure.

84 The Crowding-Out Effect

Explanation: Expansionary fiscal policy financed by borrowing raises interest rates (government competes for funds), reducing private investment -- partially offsetting the fiscal stimulus.

AP Macro Tip: Crowding out = deficit spending -> higher rates -> less investment. It weakens fiscal policy's impact.

Example: A big deficit bond issue pushes up interest rates, and firms cancel planned factory expansions.

85 Automatic Stabilizers

Explanation: Taxes and transfer programs that automatically smooth the business cycle: unemployment insurance, progressive income taxes. They increase deficits in recessions and shrink them in booms without new legislation.

AP Macro Tip: *Automatic stabilizers = built-in fiscal policy. They moderate fluctuations with no congressional action.*

Example: During a recession, unemployment benefits rise and tax receipts fall -- automatically cushioning incomes.

86 Demand Shocks in the AD-AS Model

Explanation: A rightward AD shift raises output and price level (expansion); a leftward shift lowers both (recession). Trace the full chain from shock to graph.

AP Macro Tip: *Demand shocks move output and prices in the SAME direction along SRAS.*

Example: A stock-market crash shifts AD left: output falls and prices fall -- a deflationary recession.

87 Supply Shocks in the AD-AS Model

Explanation: A negative supply shock (oil spike) shifts SRAS left: output falls while prices rise -- stagflation. A positive supply shock shifts SRAS right: output rises, prices fall.

AP Macro Tip: *Supply shocks move output and prices in OPPOSITE directions. Stagflation = the negative supply shock signature.*

Example: The 1973 OPEC embargo quadrupled oil prices, shifting SRAS left and producing stagflation.

88 Stagflation & Policy Dilemma

Explanation: Stagflation (rising prices + falling output) creates a policy dilemma: expansionary policy worsens inflation; contractionary policy deepens the recession. There is no easy AD-side fix.

AP Macro Tip: *Stagflation = SRAS shifted left. Neither fiscal nor monetary policy fixes both problems at once.*

Example: In the 1970s the Fed faced exactly this trade-off -- and inflation expectations became entrenched.

89 Short-Run vs Long-Run Adjustment

Explanation: In the short run, output can deviate from potential. In the long run, wages and prices adjust (SRAS shifts) until output returns to LRAS -- the economy self-corrects.

AP Macro Tip: *Self-correction: recessionary gap -> wages fall -> SRAS shifts right -> back to potential.*

Example: After a demand slump, falling wages eventually lower costs and restore output to potential.

90 Self-Correction in the Long Run

Explanation: With a recessionary gap, high unemployment pushes wages down, SRAS shifts right, and output returns to potential (at a lower price level). With an inflationary gap, wages rise, SRAS shifts left.

AP Macro Tip: *The economy self-corrects through wage flexibility; policy can speed the process up.*

Example: Long-run equilibrium always returns to LRAS -- the price level adjusts, not real output.

91 The Multiplier & the AD-AS Model Together

Explanation: An autonomous spending increase shifts AD right by the multiplier times the initial change; the final GDP increase is smaller than the full multiplier once the price level rises.

AP Macro Tip: *Price-level increases dampen the multiplier: the AD shift is the full multiplier, but equilibrium GDP rises less.*

Example: A \$100B AD shift with a rising price level might raise real GDP by only \$60B.

Unit 4: Unit 4: The Financial Sector

18-22% of the AP Macro exam. Money, banking, the Federal Reserve, and monetary policy.

92 The Functions of Money

Explanation: Money serves as a medium of exchange, a unit of account, and a store of value. It must be portable, divisible, durable, and scarce.

AP Macro Tip: *Money = medium of exchange + unit of account + store of value. Identify which function is being described.*

Example: Using dollars to price all goods in a store is money as a unit of account.

93 Commodity vs Fiat Money

Explanation: Commodity money has intrinsic value (gold, salt, cigarettes). Fiat money has value because the government declares it legal tender -- it is not backed by a commodity.

AP Macro Tip: *Fiat money = government decree + confidence. It is the modern standard; commodity money is historical.*

Example: US dollars are fiat money; gold coins used as currency are commodity money.

94 M1 & M2 Money Supply

Explanation: M1 = currency in circulation + demand deposits + traveler's checks. M2 = M1 + savings deposits, small time deposits, and money market funds. M2 is the broader measure.

AP Macro Tip: *M1 = cash + checking; M2 = M1 + savings + near-money. Classify assets into the correct measure.*

Example: A checking account balance is in M1; a savings account is in M2 only.

95 Financial Intermediaries

Explanation: Banks, credit unions, and other institutions channel funds from savers to borrowers, reducing risk and transaction costs. They are the plumbing of the financial system.

AP Macro Tip: *Intermediaries = savers' funds -> borrowers. Banks, mutual funds, and pension funds are all intermediaries.*

Example: A bank takes deposits and lends them to homebuyers -- intermediation in action.

96 Fractional Reserve Banking

Explanation: Banks hold only a fraction of deposits as reserves and lend the rest. This system creates money but also makes banks vulnerable to runs.

AP Macro Tip: *Reserves = the fraction of deposits kept on hand. The rest is lent out -- that is how money multiplies.*

Example: If the reserve ratio is 10%, a bank keeps \$10 of every \$100 deposit and lends \$90.

97 The Required Reserve Ratio

Explanation: The fraction of deposits banks must hold as reserves, set by the Fed. Raising it shrinks the money supply; lowering it expands it.

AP Macro Tip: *Required reserves = reserve ratio x deposits. It anchors the money multiplier.*

Example: With a 10% reserve ratio and \$1,000 in deposits, the bank must hold \$100 in reserves.

98 The Money Multiplier

Explanation: Money multiplier = $1 / \text{reserve ratio}$. It shows how much the money supply expands from each new dollar of reserves through repeated lending.

AP Macro Tip: *Money multiplier = $1/RRR$. A 10% reserve ratio yields a multiplier of 10.*

Example: A \$100 deposit with a 10% reserve ratio can ultimately create \$1,000 in the money supply.

99 How Banks Create Money

Explanation: Each loan becomes a deposit elsewhere, which can be lent again -- except for required reserves. The process expands the money supply by the multiplier.

AP Macro Tip: *Banks create money through lending, not printing. Trace the deposit -> loan -> deposit chain.*

Example: \$100 deposited, 10% reserves: \$90 loaned, \$81 loaned again... total = \$1,000.

100 The Federal Reserve: Structure

Explanation: The Fed is the US central bank: a Board of Governors (7 members, 14-year terms), 12 regional banks, and the Federal Open Market Committee (FOMC). It conducts monetary policy independently.

AP Macro Tip: *The Fed = central bank with three tools and a dual mandate. Know the Board, regional banks, and FOMC.*

Example: The New York Fed executes open market operations on behalf of the system.

101 The FOMC

Explanation: The Federal Open Market Committee (12 voting members: 7 governors + NY Fed president + 4 rotating) meets to set the target federal funds rate and direct open market operations.

AP Macro Tip: *FOMC = the monetary policy committee. It meets about 8 times a year.*

Example: The FOMC's 2022 rate hikes to fight inflation were open market decisions.

102 The Tools of Monetary Policy

Explanation: The Fed's three tools: open market operations (buying/selling bonds), the discount rate, and the reserve requirement. OMO is the most-used tool.

AP Macro Tip: *Three tools: OMO, discount rate, reserve requirement. Know the direction of each action's effect.*

Example: The Fed buys bonds to add reserves and lower rates -- expansionary OMO.

103 Open Market Operations (OMO)

Explanation: The Fed buys government bonds to add reserves (expansionary) or sells them to drain reserves (contractionary). OMO changes the federal funds rate.

AP Macro Tip: *Buying bonds = expansionary; selling bonds = contractionary. OMO is the Fed's primary tool.*

Example: To fight a recession, the Fed buys Treasury bonds, injecting reserves and pushing rates down.

104 The Discount Rate

Explanation: The interest rate the Fed charges banks for borrowing reserves directly from the discount window. Lowering it encourages borrowing and expands the money supply.

AP Macro Tip: *Discount rate = the Fed's lending rate to banks. Raising it is contractionary.*

Example: If banks need reserves, they can borrow at the discount rate -- cheaper when the Fed cuts it.

105 The Reserve Requirement

Explanation: The mandated fraction of deposits held in reserve. Lowering it frees reserves for lending (expansionary); raising it constrains lending (contractionary).

AP Macro Tip: *Lower RRR = expansionary; raise RRR = contractionary. It is a blunt tool rarely changed.*

Example: Cutting the reserve ratio from 10% to 5% doubles the money multiplier.

106 Expansionary Monetary Policy

Explanation: In a recessionary gap, the Fed buys bonds, cuts the discount rate, or lowers the reserve requirement: reserves rise, interest rates fall, investment and AD rise.

AP Macro Tip: *Expansionary monetary = easy money: buy bonds, lower rates, stimulate investment.*

Example: During 2008-09 and 2020, the Fed cut rates to near zero and bought bonds to stimulate the economy.

107 Contractionary Monetary Policy

Explanation: In an inflationary gap, the Fed sells bonds, raises the discount rate, or raises the reserve requirement: reserves fall, rates rise, investment and AD fall.

AP Macro Tip: *Contractionary monetary = tight money: sell bonds, raise rates, cool inflation.*

Example: In 2022-23, the Fed raised its target rate to fight the highest inflation in decades.

108 The Money Market & Interest Rates

Explanation: The money market sets the interest rate where money demand equals money supply. The Fed shifts money supply to change the rate.

AP Macro Tip: *Interest rate = the price of money. Money supply shifts right -> lower rates.*

Example: When the Fed increases the money supply, the interest rate falls in the money market.

109 The Demand for Money

Explanation: People hold money for transactions, precautionary, and speculative reasons. The opportunity cost of holding money is the interest foregone, so money demand falls as rates rise.

AP Macro Tip: *Money demand = transactions + precautionary + speculative motives; it slopes down with the interest rate.*

Example: Higher interest rates make cash more costly to hold, so people economize on it.

110 Bond Prices & Interest Rates

Explanation: Bond prices move inversely with interest rates: when rates rise, existing bond prices fall (and vice versa). This is central to the wealth and rate channels.

AP Macro Tip: *Inverse relationship: rates up -> bond prices down. Know the reasoning for AP questions.*

Example: A bond paying 4% falls in price when new bonds pay 6% -- investors demand a comparable yield.

111 The Loanable Funds Market

Explanation: The market where savers supply funds and borrowers demand them; the interest rate balances them. Government borrowing shifts demand, affecting crowding out.

AP Macro Tip: *Loanable funds = savings supply vs investment demand. The equilibrium rate is the 'price of capital.'*

Example: A federal deficit raises the demand for loanable funds, pushing up interest rates.

112 Crowding Out in the Loanable Funds Market

Explanation: Deficit-financed government spending increases the demand for loanable funds, raising interest rates and reducing private investment -- crowding out.

AP Macro Tip: *Crowding out = deficit -> higher rates -> less private investment. Graph it in the loanable funds market.*

Example: Bond-financed stimulus can leave total spending roughly unchanged if investment falls dollar-for-dollar.

113 The Fisher Effect & Inflation Expectations

Explanation: Expected inflation raises nominal interest rates: lenders demand compensation for lost purchasing power. Real rates are what matter for investment decisions.

AP Macro Tip: *Fisher: nominal = real + expected inflation. Inflation expectations drive nominal rates.*

Example: If inflation expectations rise 2 points, nominal loan rates rise about 2 points.

114 The Quantity Theory of Money ($MV = PQ$)

Explanation: $MV = PQ$: money supply x velocity = price level x real output. In the long run, money growth determines inflation; velocity and output are stable.

AP Macro Tip: *$MV = PQ$ is the long-run link between money and prices. Doubling M doubles P if V and Q are fixed.*

Example: With V and Q stable, 10% money growth produces ~10% inflation in the long run.

115 The Velocity of Money

Explanation: Velocity = the number of times each dollar is spent per year ($V = PQ/M$). It reflects how actively money circulates; it fell sharply during the pandemic.

AP Macro Tip: *Velocity = PQ/M . If velocity changes, money growth and inflation diverge in the short run.*

Example: During 2020, stimulus checks sat in accounts -- velocity fell even as M exploded.

116 The Federal Funds Rate

Explanation: The interest rate banks charge each other for overnight reserve loans. The Fed targets it via OMO; it anchors the rest of the rate structure.

AP Macro Tip: *The fed funds rate is the Fed's operating target -- raised or lowered through bond purchases and sales.*

Example: The FOMC's target range (e.g., 5.25-5.50%) guides short-term rates economy-wide.

117 The Lender of Last Resort

Explanation: The Fed lends to banks in distress to prevent bank runs and financial panic. It balances stability against moral hazard.

AP Macro Tip: *Lender of last resort = emergency liquidity to stop panics. The 2008 and 2020 interventions were examples.*

Example: In 2008 the Fed lent to keep money market funds and major banks from collapsing.

118 Bank Runs & the Money Supply

Explanation: A bank run (many depositors withdrawing at once) can destroy a solvent bank and shrink the money supply as loans are called in. Deposit insurance prevents runs.

AP Macro Tip: *Runs -> money supply contraction; deposit insurance (FDIC) prevents them.*

Example: The 1930s bank runs collapsed the money supply and deepened the Great Depression.

119 The Transmission Mechanism

Explanation: Monetary policy works through: Fed changes reserves -> interest rates -> investment and consumption -> AD -> output and prices.

AP Macro Tip: *Chain: OMO -> reserves -> rates -> investment -> AD -> GDP. Write the full chain in FRQ answers.*

Example: Buying bonds lowers rates; firms borrow more; AD shifts right; output rises.

120 Monetary vs Fiscal Policy

Explanation: Fiscal policy (Congress/president) uses spending and taxes; monetary policy (the Fed) uses interest rates and money supply. Monetary acts faster but fiscal can target specific groups.

AP Macro Tip: *Fiscal = budget tools; monetary = money tools. Compare speed, targeting, and political control.*

Example: The Fed can cut rates within weeks; Congress's stimulus takes months to pass.

121 The Financial Sector & AD

Explanation: Financial conditions transmit to AD: lower rates boost interest-sensitive spending (housing, autos, business investment) and raise asset prices, supporting wealth and spending.

AP Macro Tip: *Cheap money -> more borrowing and spending -> AD right. Tight money -> the reverse.*

Example: Low mortgage rates in 2020-21 fueled a housing boom -- the financial sector boosting AD.

Unit 5: Unit 5: Long-Run Consequences of Stabilization Policies

15-21% of the AP Macro exam. The Phillips curve, growth, debt, and the long-run effects of policy.

122 The Phillips Curve

Explanation: The Phillips curve shows an inverse short-run relationship between inflation and unemployment: lower unemployment comes with higher inflation and vice versa.

AP Macro Tip: *Short-run Phillips curve = the inflation-unemployment trade-off. It is the policy frontier.*

Example: Stimulus lowers unemployment to 3% but inflation rises to 6% -- a move along the Phillips curve.

123 The Short-Run Phillips Curve (SRPC)

Explanation: The SRPC slopes downward: expansionary policy moves the economy up the curve (less unemployment, more inflation); contractionary moves it down.

AP Macro Tip: *SRPC = the trade-off. Shifts occur when expectations or supply shocks change.*

Example: A demand boom moves the economy along the SRPC toward lower unemployment and higher inflation.

124 The Long-Run Phillips Curve (LRPC)

Explanation: The LRPC is vertical at the natural rate of unemployment: in the long run, there is no trade-off -- unemployment returns to the natural rate regardless of inflation.

AP Macro Tip: *LRPC = vertical at the natural rate. Inflation expectations adjust, so policy cannot permanently buy lower unemployment.*

Example: In the long run, expansionary policy yields only higher inflation -- unemployment reverts to 5%.

125 The Natural Rate Hypothesis

Explanation: The view (Friedman, Phelps) that unemployment returns to its natural rate in the long run; only unexpected inflation can temporarily push it below natural.

AP Macro Tip: *Natural rate hypothesis: no permanent unemployment-inflation trade-off. Expectations are the key.*

Example: Attempts to hold unemployment below natural produce accelerating inflation, not lasting jobs.

126 Adaptive vs Rational Expectations

Explanation: Adaptive expectations extrapolate past inflation; rational expectations use all available information. Rational expectations imply policy surprises matter, not anticipated policy.

AP Macro Tip: *Adaptive = backward-looking; rational = forward-looking. Anticipated policy has no real effect under rational expectations.*

Example: If workers fully anticipate a stimulus-induced price rise, wages adjust instantly and unemployment does not fall.

127 Expectations & the Phillips Curve

Explanation: Higher expected inflation shifts the SRPC up (worse trade-off at every unemployment rate). Anchored expectations keep the trade-off stable.

AP Macro Tip: *Expectations shift the SRPC: expectations up -> SRPC up. Anchoring expectations is a central bank goal.*

Example: In the 1970s, entrenched inflation expectations kept the SRPC high -- disinflation required a painful recession.

128 Supply Shocks & the Phillips Curve

Explanation: A negative supply shock (oil spike) raises both inflation and unemployment -- stagflation -- shifting the SRPC up and right. Policy faces a worse trade-off.

AP Macro Tip: *Supply shocks shift the Phillips curve itself; demand policies only move along it.*

Example: The 1973 oil shock pushed inflation to 12% and unemployment to 9% simultaneously.

129 The Policy Trade-Off & Sacrifice Ratio

Explanation: Disinflation costs output: the sacrifice ratio measures the GDP lost per point of inflation reduced. Credible policy lowers the sacrifice ratio.

AP Macro Tip: *Sacrifice ratio = output lost per 1 point of inflation cut. Credibility reduces the pain.*

Example: The Volcker disinflation of 1981-82 triggered a deep recession -- the price of breaking inflation.

130 Government Debt & Deficits

Explanation: A deficit is annual spending minus revenue; debt is the accumulated stock. Persistent deficits raise the debt, burdening future generations with interest payments.

AP Macro Tip: *Deficit = flow; debt = stock. Debt grows when deficits persist; interest payments crowd the budget.*

Example: US federal debt exceeded \$33 trillion in 2023 -- over 120% of GDP.

131 The Crowding-Out Effect (Long Run)

Explanation: Persistent deficits keep interest rates high, reducing private capital formation and slowing long-run growth -- a permanent cost of debt.

AP Macro Tip: *Long-run crowding out = deficits reduce investment and growth. It connects fiscal policy to the LRAS.*

Example: Every dollar the government borrows may displace a dollar of private investment in plants and equipment.

132 Economic Growth: The Sources

Explanation: Growth comes from increases in labor, physical capital, human capital, and technology/productivity. Only productivity growth sustains rising living standards.

AP Macro Tip: *Growth = more inputs OR more productivity. Technology is the key to sustained per-capita growth.*

Example: The Industrial Revolution raised living standards through productivity, not just more workers.

133 The Solow Model (Intro)

Explanation: The Solow growth model: output depends on capital and labor; capital accumulation faces diminishing returns, so growth requires technology in the long run.

AP Macro Tip: *Diminishing returns to capital -> steady state; technology is the engine of long-run growth.*

Example: Adding more machines raises output at a decreasing rate -- eventually technology matters more.

134 Human Capital & Growth

Explanation: Human capital = the knowledge, skills, and health of workers (education, training). It raises productivity and is a key source of growth.

AP Macro Tip: *Human capital = investment in people. Education spending boosts LRAS and long-run growth.*

Example: A more educated workforce produces more per hour -- human capital at work.

135 Physical Capital & Diminishing Returns

Explanation: Physical capital (machines, factories, infrastructure) raises output, but each additional unit adds less output than the last -- diminishing returns.

AP Macro Tip: *Diminishing returns to capital: each machine adds less than the previous one. Poor countries gain most from capital investment.*

Example: Doubling a factory's robots does not double its output -- the marginal product of capital falls.

136 Technological Progress

Explanation: Technology (innovation, better processes, new products) shifts the production function up, raising output per worker and shifting LRAS right.

AP Macro Tip: *Technology = the long-run engine of growth. It overcomes diminishing returns to capital.*

Example: The internet, automation, and AI all shift LRAS right by raising productivity.

137 The Rule of 70

Explanation: Doubling time = $70 / \text{annual growth rate}$. A 2% growth rate doubles GDP in 35 years; 7% doubles in 10 years.

AP Macro Tip: *Rule of 70 = $70/\text{growth rate}$. Use it to compare growth rates across countries.*

Example: China's ~10% growth in the 2000s doubled its economy about every 7 years.

138 Growth Policy & Institutions

Explanation: Growth-promoting policies: property rights, stable institutions, free trade, investment in education and infrastructure, R&D support, and sound monetary policy.

AP Macro Tip: *Institutions and incentives drive growth: property rights, rule of law, trade, education, R&D.*

Example: Countries with secure property rights and open trade grow faster than closed, unstable ones.

139 The Keynesian Model

Explanation: Keynesian economics: aggregate demand drives output in the short run; wages are sticky; government should manage demand to fight recessions.

AP Macro Tip: *Keynes = demand management, sticky prices, activist policy. It justifies fiscal stimulus.*

Example: FDR's New Deal and the 2009 stimulus were Keynesian responses to demand collapse.

140 The Classical Model

Explanation: Classical economics: flexible prices and wages keep the economy at full employment; markets self-correct; government intervention is unnecessary and harmful.

AP Macro Tip: *Classical = self-correcting markets, laissez-faire. It underpins the vertical LRAS.*

Example: Classical economists argued the Great Depression would self-correct -- it did not, quickly.

141 Monetarism (Friedman)

Explanation: Monetarism: the money supply is the main driver of nominal GDP; inflation is always a monetary phenomenon; the Fed should follow a stable money-growth rule.

AP Macro Tip: *Monetarism = money matters most; stable money growth; 'inflation is always and everywhere a monetary phenomenon.'*

Example: Friedman blamed the Fed for the Great Depression -- it let the money supply collapse.

142 Supply-Side Economics

Explanation: Supply-side policy uses tax cuts and deregulation to boost incentives to work, save, and invest, shifting LRAS right -- growth without inflation.

AP Macro Tip: *Supply-side = shift LRAS right via incentives. The Laffer curve is its revenue argument.*

Example: The 1981 and 2017 tax cuts were supply-side experiments -- with mixed growth results.

143 Discretionary vs Rules-Based Policy

Explanation: Discretionary policy responds to current conditions but suffers from time lags and political pressure. Rules-based policy (inflation targeting, money-growth rules) is predictable and credible.

AP Macro Tip: *Rules = predictable; discretion = flexible but lag-prone. Credibility lowers inflation expectations.*

Example: The Fed's 2% inflation target is a rules-based anchor within a discretionary framework.

144 Time Lags in Policy

Explanation: Policy lags: recognition (data delays), implementation (legislative process), and impact (policy takes months to work). Lags can make stabilization policy destabilizing.

AP Macro Tip: *Recognition, implementation, and impact lags. Fiscal lags are the longest.*

Example: A stimulus passed after a recession ends can overheat the recovery -- the lag problem.

145 The Political Business Cycle

Explanation: Elected officials may manipulate policy to boost the economy before elections, creating a boom-bust pattern -- the political business cycle.

AP Macro Tip: *Political business cycle = election-driven policy swings. Independent central banks reduce it.*

Example: Incumbents often pursue stimulus in election years and austerity after.

146 Austerity vs Stimulus

Explanation: Austerity (spending cuts, tax hikes) reduces deficits but can deepen recessions. Stimulus (spending, tax cuts) fights recessions but raises debt. The debate is about timing and trade-offs.

AP Macro Tip: *Austerity = deficit reduction (pro-cyclical risk); stimulus = demand support (counter-cyclical).*

Example: European austerity after 2010 prolonged the eurozone recession; the 2009 US stimulus shortened it.

147 The Inflation Tax & Seigniorage

Explanation: Governments can finance spending by printing money; the resulting inflation taxes cash holders. Seigniorage = the revenue from money creation.

AP Macro Tip: *Printing money = inflation tax. Excessive reliance causes hyperinflation.*

Example: Weimar Germany and Zimbabwe financed deficits by printing money -- the result was hyperinflation.

148 Hyperinflation & Policy Credibility

Explanation: Hyperinflation results from explosive money growth, typically to fund deficits. Ending it requires credible commitment to stop printing money.

AP Macro Tip: *Hyperinflation = money-growth runaway. Fix = credible central bank independence.*

Example: Germany's 1923 hyperinflation ended when the central bank credibly stabilized the currency.

149 Financial Crises & Macro Policy

Explanation: Financial crises (2008, 2020) transmit to the real economy through credit contraction. Policy responds with lender-of-last-resort lending, guarantees, and stimulus.

AP Macro Tip: *Crises = credit freeze -> AD collapse. Expect a mix of monetary and fiscal rescue.*

Example: The 2008 TARP and Fed emergency facilities prevented a total banking collapse.

150 The Great Recession & the Response

Explanation: The 2007-09 crisis: housing bust, bank failures, and a deep recession. Response: near-zero rates, QE, TARP, and a large fiscal stimulus. Recovery was slow.

AP Macro Tip: *2008 = the modern crisis case study: monetary easing + fiscal stimulus + financial rescue.*

Example: The Fed's quantitative easing expanded its balance sheet from \$900B to \$4.5T.

151 Debt Sustainability & the Long Run

Explanation: Debt is sustainable if growth outpaces interest rates or surpluses repay it. High debt raises interest costs, reduces fiscal space, and risks crisis -- the long-run fiscal challenge.

AP Macro Tip: *Sustainability = growth vs interest rates. High debt = higher interest burden and less room to respond to shocks.*

Example: Japan runs 250%+ debt-to-GDP yet services it because its interest rates are ultra-low.

Unit 6: Unit 6: Open Economy - International Trade & Finance

10-13% of the AP Macro exam. Balance of payments, exchange rates, and trade policy.

152 The Balance of Payments

Explanation: The record of all transactions between a country and the rest of the world: the current account plus the capital/financial account. They sum to zero.

AP Macro Tip: *Balance of payments = current account + financial account = 0. Every international transaction has two sides.*

Example: A US import is a current account outflow matched by a financial account inflow (foreigners hold dollars).

153 The Current Account

Explanation: The current account tracks trade in goods and services, net investment income, and net transfers. A trade deficit means imports exceed exports.

AP Macro Tip: *Current account = goods + services + income + transfers. Trade balance is its largest component.*

Example: The US runs a large current account deficit -- it imports more than it exports.

154 The Financial Account

Explanation: The financial (capital) account tracks purchases of assets across borders: foreign investment in US assets (inflows) and US investment abroad (outflows).

AP Macro Tip: *Financial account = asset flows. Buying US bonds = a financial account inflow.*

Example: A Chinese firm building a factory in Ohio is a financial account inflow for the US.

155 The Trade Deficit & Surplus

Explanation: A trade deficit (imports > exports) means the current account is negative. It is financed by financial account inflows -- foreigners lend to or invest in the country.

AP Macro Tip: *Deficit = imports > exports, financed by capital inflows. It is not inherently bad.*

Example: The US trade deficit is matched by foreign purchases of US Treasuries and assets.

156 The Foreign Exchange Market

Explanation: The FOREX market sets exchange rates: the price of one currency in terms of another, determined by demand and supply of currencies.

AP Macro Tip: *Exchange rate = price of currency. Demand for dollars comes from foreigners wanting US goods and assets.*

Example: If Europeans buy more US exports, they demand more dollars, and the dollar appreciates.

157 Appreciation & Depreciation

Explanation: Appreciation = a currency gains value (buys more foreign currency). Depreciation = it loses value. Appreciation makes imports cheaper and exports more expensive.

AP Macro Tip: *Appreciated currency -> cheaper imports, costlier exports (worse for net exports). Depreciation is the reverse.*

Example: If the dollar goes from 1.1 to 1.2 euros, the dollar appreciated against the euro.

158 Determinants of Exchange Rates

Explanation: Currencies are driven by interest rates (higher rates attract capital), inflation (higher inflation weakens the currency), income, trade preferences, and expectations/speculation.

AP Macro Tip: *Higher real interest rates -> stronger currency. Higher inflation -> weaker currency.*

Example: When the Fed raises rates, foreign investors buy US bonds, driving the dollar up.

159 Exchange Rates & Net Exports

Explanation: A weaker domestic currency raises net exports (exports cheaper, imports pricier); a stronger one lowers net exports. This links FOREX to AD.

AP Macro Tip: Depreciation $\rightarrow$ X_n up $\rightarrow$ AD right. Appreciation $\rightarrow$ X_n down $\rightarrow$ AD left.

Example: A falling dollar boosts US manufacturing exports and makes imported cars costlier.

160 The Loanable Funds Market (Open Economy)

Explanation: In an open economy, high domestic interest rates attract foreign capital, appreciating the currency and reducing net exports -- the international crowding-out channel.

AP Macro Tip: Rates $\rightarrow$ capital inflows $\rightarrow$ appreciation $\rightarrow$ lower X_n . The open-economy transmission.

Example: A US rate hike attracts foreign funds, appreciating the dollar and hurting US exports.

161 Comparative Advantage & Trade (Review)

Explanation: Countries gain from specializing in goods with lower opportunity costs and trading. Trade raises total world output even when one country has absolute advantage in everything.

AP Macro Tip: Trade is driven by comparative, not absolute, advantage. Both sides gain.

Example: Even if the US is best at everything, it gains by importing goods where its advantage is smallest.

162 Tariffs

Explanation: A tax on imports: raises the domestic price, protects domestic producers, and raises government revenue -- but creates deadweight loss and hurts consumers.

AP Macro Tip: Tariff = tax on imports $\rightarrow$ higher prices, less trade, deadweight loss. Consumers lose; domestic producers gain.

Example: The 1930 Smoot-Hawley tariffs deepened the Great Depression by choking world trade.

163 Quotas & Nontariff Barriers

Explanation: A quota limits the quantity of imports; nontariff barriers (regulations, standards) restrict trade indirectly. Both raise prices and create deadweight loss without government revenue.

AP Macro Tip: Quota = quantity limit. It benefits domestic producers at the cost of consumers and efficiency.

Example: The US sugar quota raises domestic sugar prices well above world levels.

164 Free Trade vs Protectionism

Explanation: Free trade maximizes efficiency and consumer welfare. Protectionism (tariffs, quotas) shields domestic industries but raises prices and invites retaliation.

AP Macro Tip: Free trade = efficiency; protection = shielding jobs/industries at a cost. Weigh winners and losers.

Example: The 2018-19 US-China tariff war raised prices for consumers on both sides.

165 The Gains from Trade

Explanation: Trade expands consumption possibilities beyond the PPC, allows specialization, spreads technology, and increases competition and variety.

AP Macro Tip: Trade = consumption beyond the PPC + specialization gains. The exam wants the gains enumerated.

Example: A country can consume combinations outside its PPC by exporting what it produces best and importing the rest.

166 Exchange Rates & the AD-AS Model

Explanation: A depreciation shifts AD right (net exports rise), raising output and the price level. Appreciation does the reverse.

AP Macro Tip: Depreciation $\rightarrow$ X_n up $\rightarrow$ AD right. Appreciation $\rightarrow$ X_n down $\rightarrow$ AD left.

Example: A weak dollar boosts US exports, shifting AD right and raising GDP and prices.

167 The Current Account & Financial Account Link

Explanation: A current account deficit is financed by a financial account surplus: foreigners fund the trade gap by buying domestic assets.

AP Macro Tip: *Current account deficit = financial account surplus (they offset). Capital flows finance trade.*

Example: The US current account deficit is matched by foreign purchases of US Treasuries, stocks, and real estate.

168 Fixed vs Floating Exchange Rates

Explanation: Floating rates are set by markets and adjust automatically. Fixed rates (pegs) are set by governments, which must intervene using reserves to maintain them.

AP Macro Tip: *Floating = market-determined; fixed = government-set with intervention. Most major currencies float.*

Example: Hong Kong pegs its dollar to the US dollar; the Fed-era dollar floats freely.

169 Currency Intervention

Explanation: Central banks can buy or sell their currency to influence its value: buying domestic currency strengthens it; selling weakens it. Intervention uses foreign exchange reserves.

AP Macro Tip: *Intervention = buying/selling currency to manage its value. It is hard to sustain against market forces.*

Example: Japan has repeatedly sold yen to weaken it and support exporters.

170 The Trade Deficit: Causes & Effects

Explanation: Trade deficits arise from low national saving, strong investment, or an appreciated currency. They mean the country borrows from abroad -- a capital inflow, not necessarily a problem.

AP Macro Tip: *Trade deficit = borrowing from abroad. It reflects saving-investment gaps, not just 'bad trade deals.'*

Example: The US deficit widened in the 2000s as Americans saved less and the dollar stayed strong.

171 Capital Flows & Interest Rates

Explanation: Capital flows toward higher real returns. Countries with high rates attract inflows, appreciating their currency; low rates push capital out, depreciating it.

AP Macro Tip: *High rates -> capital inflows -> appreciation. Low rates -> outflows -> depreciation.*

Example: Emerging markets with high rates attract 'hot money' that flees when conditions change.

172 Global Supply Chains & Trade

Explanation: Modern trade is fragmented: goods cross borders many times as components. This makes measured trade balances less meaningful and supply shocks more contagious.

AP Macro Tip: *Supply chains = trade in intermediate goods. Shocks (COVID, Suez) transmit through them.*

Example: The 2021 supply-chain crunch raised prices worldwide as shipping and chip shortages spread.

173 The Euro & Common Currency Issues

Explanation: The euro fixes exchange rates among members but removes independent monetary policy. Countries in crises (Greece 2010) cannot devalue -- a key cost of currency union.

AP Macro Tip: *Currency union = no independent monetary policy, no devaluation tool. Fiscal problems become shared.*

Example: Greece could not devalue during its 2010 crisis -- austerity was its only adjustment tool.

174 International Institutions: IMF, World Bank, WTO

Explanation: The IMF provides crisis lending and monitors exchange rates; the World Bank funds development; the WTO sets trade rules and settles disputes.

AP Macro Tip: *IMF = crisis finance; World Bank = development; WTO = trade rules. Match each institution to its role.*

Example: The IMF's 2010 bailout of Greece came with austerity conditions.

175 Exchange Rate Effects on Business

Explanation: Depreciation helps exporters and firms competing with imports but raises the cost of imported inputs; appreciation does the opposite. Businesses hedge currency risk.

AP Macro Tip: *Currency moves redistribute competitiveness: exporters win from depreciation.*

Example: A weak yen boosted Toyota's export profits; a strong dollar squeezes US multinationals' foreign earnings.

176 Foreign Direct Investment (FDI)

Explanation: FDI = cross-border investment in physical assets (factories, acquisitions). It brings capital, technology, and jobs -- a long-term financial account inflow.

AP Macro Tip: *FDI = long-term productive investment, distinct from short-term portfolio flows.*

Example: Foreign automakers building US plants (Toyota, BMW) are FDI into the US.

177 Purchasing Power Parity (PPP)

Explanation: PPP: exchange rates adjust so that identical goods cost the same across countries in the long run. Deviations exist due to transport costs, tariffs, and nontraded goods.

AP Macro Tip: *PPP = the 'big mac' theory: exchange rates track relative price levels over time.*

Example: A Big Mac costs less in Mexico than the US, so the peso is 'undervalued' relative to PPP.

178 The J-Curve Effect

Explanation: After a depreciation, the trade balance may initially worsen (existing contracts) before improving as volumes adjust -- the J-curve.

AP Macro Tip: *J-curve = short-run deterioration, long-run improvement after depreciation.*

Example: The US trade deficit briefly widened after the 1985 Plaza Accord before improving.

179 Net Capital Outflow (NCO)

Explanation: NCO = domestic saving minus domestic investment; it equals net foreign investment. NCO finances the current account balance.

AP Macro Tip: *NCO = S - I. Positive NCO = the country lends abroad; negative = it borrows.*

Example: Japan's high saving and low investment produced large NCO and a persistent surplus.

180 The Twin Deficits

Explanation: Budget deficits can cause trade deficits: government borrowing raises interest rates, attracting capital, appreciating the currency, and worsening net exports.

AP Macro Tip: *Twin deficits = fiscal deficit -> strong currency -> trade deficit. The Reagan-era pattern.*

Example: Reagan's tax cuts and defense build-up produced record budget AND trade deficits in the 1980s.

181 Globalization: Winners & Losers

Explanation: Globalization raises overall output and lowers prices, but the gains are uneven: import-competing workers lose jobs, while consumers and exporters gain. Policy debates center on compensation.

AP Macro Tip: *Globalization = net gains with distributional losses. Know both sides of the debate.*

Example: US manufacturing employment fell as trade with China grew, even as consumers enjoyed cheaper goods.

What's Next?

You have now reviewed every unit of the AP Macroeconomics course, including all the graphs and formulas. Go back to the Table of Contents, find the units you marked, and reread just those tip lines. Two weeks out, do a rapid pass over the entire guide; the day before, review only the tip lines. On the FRQs, draw and label every graph (AD-AS, money market, loanable funds, FOREX), shift the correct curve in the correct direction, and explain the chain of reasoning step by step -- graph labels and the transmission mechanism are where most points are won and lost.

Pair it with the AP Microeconomics Study Guide (\$19) -- both econ exams covered

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