

National Income and Price Determination

AP Macroeconomics

Aggregate Demand



A city skyline: national output and aggregate demand reflect economy-wide spending

Aggregate demand (AD) 总需求 shows the total quantity of real output ($C + I + G + X_n$) buyers want at each **price level** 价格水平. It slopes **downward** for three reasons special to the whole economy:



$$AD = C + I + G + (X - M): \text{ total spending on a country's goods and services}$$

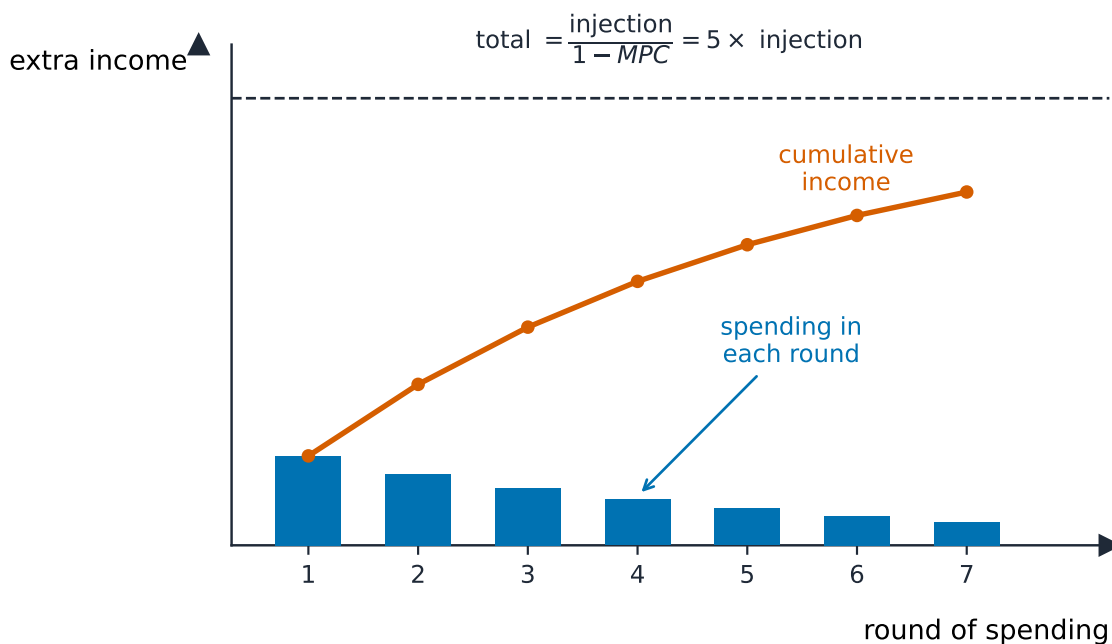
Aggregate demand is total spending: consumption, investment, government, and net exports

- the **wealth effect** 财富效应 (a higher price level shrinks the real value of money, so people buy less),
- the **interest-rate effect** 利率效应 (a higher price level raises money demand and interest rates, cutting investment),
- the **net-export effect** (a higher domestic price level makes exports dearer and imports cheaper).

A change in the price level is a **movement along AD**. AD **shifts** when any component of $C + I + G + X_n$ changes for another reason – consumer confidence, business expectations, government spending, taxes, or foreign incomes.

The Spending and Tax Multipliers

A change in spending sets off further rounds of spending, so the final change in GDP is **larger** than the initial change – the **multiplier effect** 乘数效应. It depends on the **marginal propensity to consume** 边际消费倾向 (MPC), the fraction of extra income that is spent (the rest is the **marginal propensity to save** 边际储蓄倾向, MPS, with $MPC + MPS = 1$):



One injection multiplies into a larger overall rise in income

$$\text{spending multiplier} = \frac{1}{1 - MPC} = \frac{1}{MPS}.$$

A tax cut works through the multiplier too, but more weakly, because part of the tax cut is saved:

$$\text{tax multiplier} = -\frac{MPC}{1 - MPC} = -\frac{MPC}{MPS}.$$

The tax multiplier is **smaller in size** and **negative** (a tax cut raises GDP; a tax rise lowers it). Total change in GDP = (multiplier) $\times$ (initial change).

Worked example. If $MPC = 0.8$, the spending multiplier is $\frac{1}{1 - 0.8} = 5$, so a \$10 billion rise in government spending lifts real GDP by $5 \times \$10 = \50 billion. The tax

multiplier is $-\frac{0.8}{0.2} = -4$, so a \$10 billion **tax cut** raises GDP by only \$40 billion – weaker, because part of the tax cut is saved.

Exam skill: compute both multipliers from the MPC and find the resulting change in real GDP – an almost-guaranteed calculation.

Short-Run Aggregate Supply



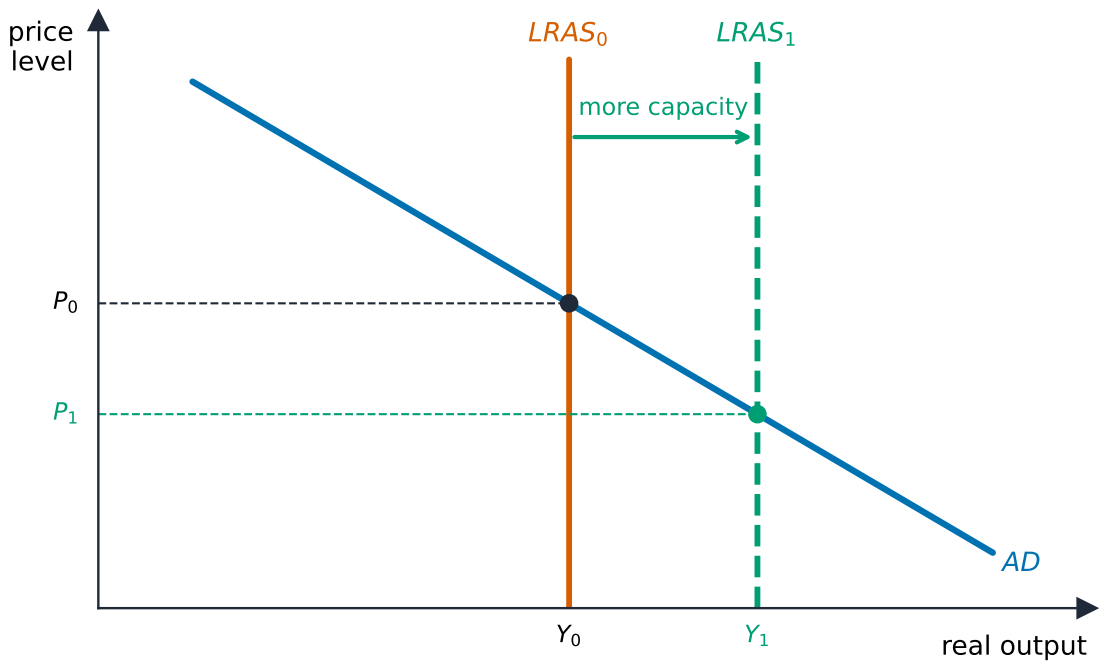
A power plant and industrial site: short-run aggregate supply depends on production costs

Short-run aggregate supply (SRAS) 短期总供给 slopes **upward**: in the short run some input prices (especially **nominal wages** 名义工资) are **sticky** 粘性, so a higher output price level widens profit margins and firms produce more. SRAS **shifts** with **input prices, productivity, taxes/subsidies on producers**, and **supply shocks** (e.g. an oil-price change). A rise in input costs shifts SRAS left.

Long-Run Aggregate Supply

Long-run aggregate supply (LRAS) 长期总供给 is **vertical** at the economy's **full-employment (potential) output** 潜在产出 Y_f . In the long run **all** prices and wages are fully **flexible** (only in the short run are some input prices fixed), so output depends only on real factors – resources, technology, institutions – not the price level. LRAS shifts only with **economic growth** (more or better resources). LRAS corresponds to the **production possibilities curve (PPC)** 生产可能性曲线: both mark the economy's **maximum sustainable capacity**, so an outward LRAS shift

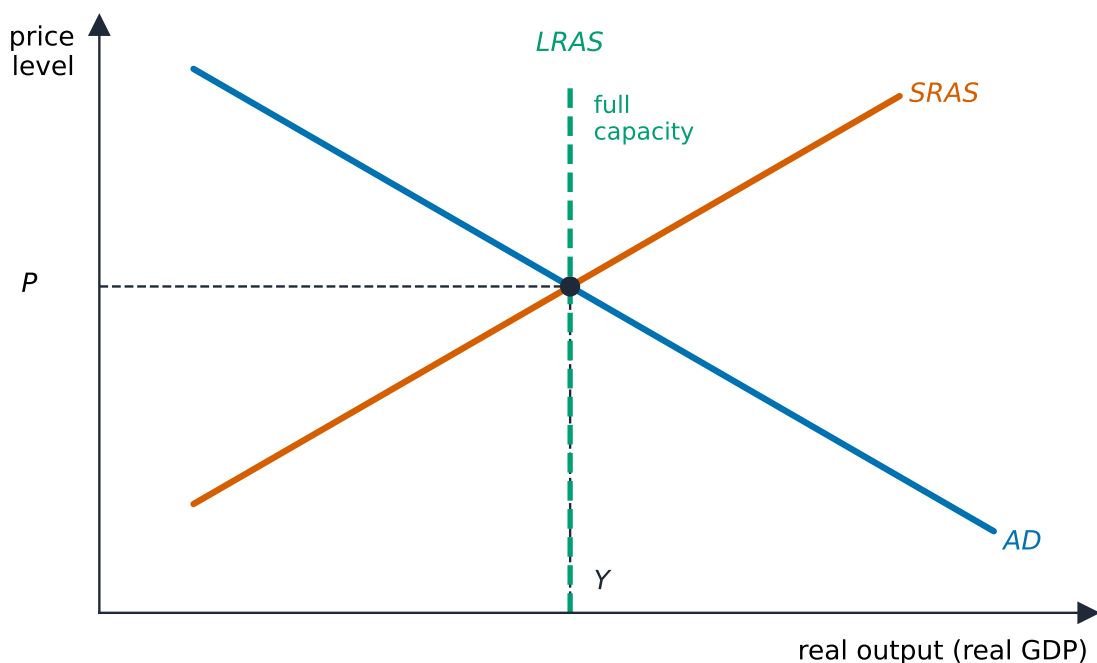
and an outward PPC shift are the same event drawn two ways. The vertical LRAS is why, in the long run, demand policy changes prices, not output.



Supply-side policy shifts long-run aggregate supply right: more output, lower prices

Equilibrium in the AD-AS Model

The economy settles where **AD meets SRAS**, fixing the equilibrium **price level** and **real GDP**. Comparing that output to Y_f (the LRAS line) gives the economy's state:



Macroeconomic equilibrium where aggregate demand meets aggregate supply

- output $< Y_f$: a **recessionary gap** 衰退缺口 (cyclical unemployment),
- output $> Y_f$: an **inflationary gap** 通胀缺口 (overheating),
- output $= Y_f$: long-run equilibrium.

Short-Run Changes: Demand and Supply Shocks

- A **demand shock** shifts AD: a positive one (more spending) raises both price level and output (and lowers unemployment); a negative one lowers both.
- A **supply shock** shifts SRAS: a negative one (higher input costs) raises the price level **and** lowers output at once – **stagflation** 滞胀 – the hardest case for policy-makers, because fixing one worsens the other.

Long-Run Self-Adjustment

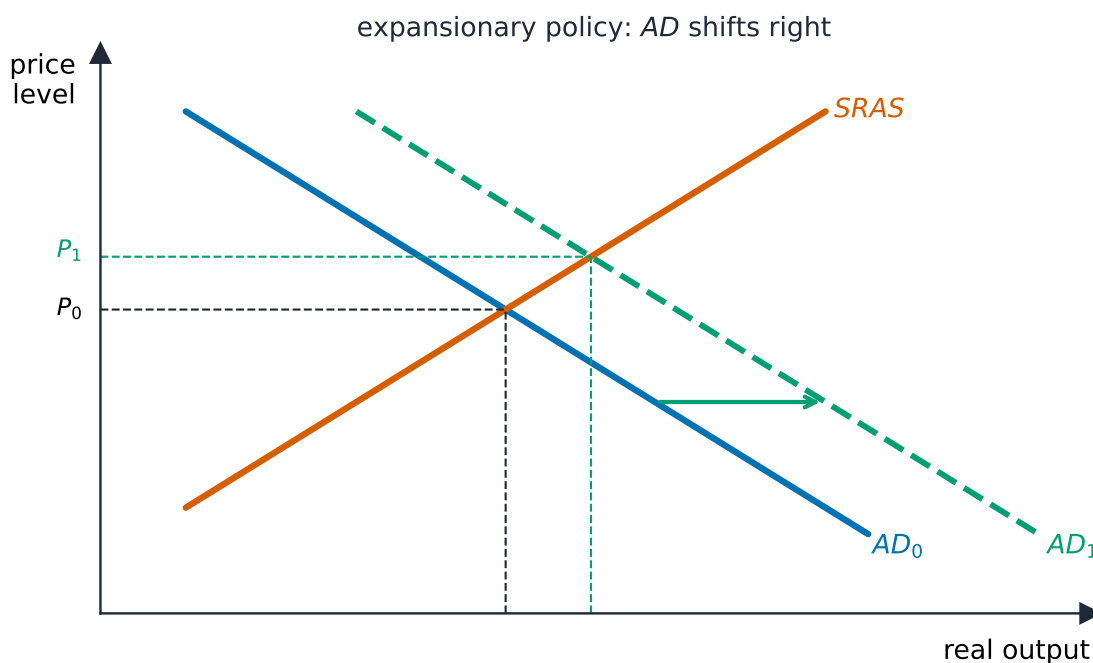
Left alone, the economy self-corrects through flexible wages:

- In a **recessionary gap**, high unemployment eventually pushes **nominal wages down**, shifting SRAS **right** until output returns to Y_f at a lower price level.
- In an **inflationary gap**, labor shortages push **wages up**, shifting SRAS **left** back to Y_f at a higher price level.

The debate over how **fast** this happens is the case for (or against) active policy: self-adjustment is slow and painful, which is the argument for intervening.

Fiscal Policy

Fiscal policy 财政政策 is the government's use of **spending** and **taxes** to shift AD:



Expansionary fiscal policy shifts AD right, raising output and prices

- **Expansionary** 扩张性 (more spending or lower taxes) shifts AD **right** to close a **recessionary gap**.
- **Contractionary** 紧缩性 (less spending or higher taxes) shifts AD **left** to close an **inflationary gap**.

Size the policy with the multipliers: to close a gap of a given size, the required change in spending is $(\text{gap}) \div (\text{spending multiplier})$. Limits include **time lags**, **crowding**

out (below), and political difficulty.

Worked example. An economy has a \$100 billion recessionary gap and $MPC = 0.75$ (spending multiplier $= \frac{1}{0.25} = 4$). To close it, the government must raise spending by $\frac{\$100 \text{ billion}}{4} = \25 billion . Using a tax cut instead (tax multiplier -3) would require a larger $\frac{100}{3} \approx \$33 \text{ billion}$ cut.

Exam skill: you must draw the correctly labeled AD-AS graph, identify the gap, prescribe the right fiscal action and its direction, and often calculate the exact spending or tax change needed.

Automatic Stabilizers

Automatic stabilizers 自动稳定器 are features that dampen the cycle **without new legislation**. In a downturn, **progressive taxes** collect less and **transfer payments** (unemployment benefits, welfare) rise automatically – cushioning incomes and spending; in a boom they do the reverse. They soften the cycle and act instantly, avoiding the lags of **discretionary** 相机抉择 policy.

Exam tips

- Aggregate demand slopes down for the wealth, interest-rate, and net-export effects; it **shifts** when C , I , G , or X_n changes.
- Compute the **spending multiplier** $\frac{1}{1-MPC}$ and the smaller, negative **tax multiplier** $-\frac{MPC}{1-MPC}$.
- Draw a correctly labeled AD-AS graph, identify a recessionary or inflationary gap, and prescribe the right fiscal action.
- Short-run AS slopes up (sticky wages); long-run AS is **vertical** at full-employment output.
- Size a policy with the multipliers: required spending = gap $\div$ spending multiplier.