Bilkent University
Department of Economics

AD/AS: From Real Variables to Prices

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March 29, 2026

The Story So Far

1. Solow Growth Model

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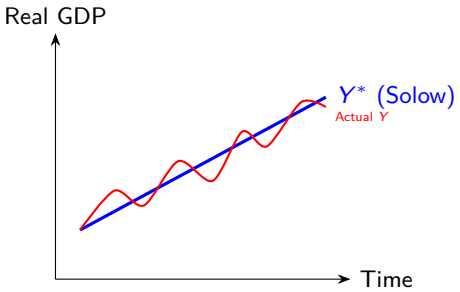

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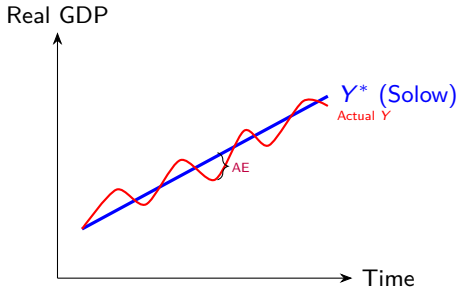
2. Aggregate Expenditure (AE) Model

- Gave us **short-run fluctuations** around that **trend**.
- Expenditure determines output: $Y = C + I + G + NX$.
- But: everything was in **real** terms (the price level was *fixed*).



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Türkiye context:

- 2018–2019: currency crisis + recession (AD left + SRAS left from lira depreciation raising import costs).
- 2021–2023: heterodox low-rate policy $\Rightarrow$ AD kept shifting right $\Rightarrow$ severe overheating.
- Mid-2023 onward: policy reversal, rate hikes to cool demand (classic AD management).

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⇒ **Aggregate Demand / Aggregate Supply (AD/AS)**

And notice that: since Solow tells us Y^* depends only on K, L, technology, **not** on P, the long-run aggregate supply curve at Y^* must be **vertical**. That's exactly the LRAS curve.

Quick Recall: Real GDP vs. Nominal GDP

Fill in:

- Nominal GDP = quantities $\times$ **???** prices
- Real GDP = quantities $\times$ **???** prices
- The GDP deflator $= \dfrac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$

Quick Recall: Real GDP vs. Nominal GDP

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Quick Recall: Real GDP vs. Nominal GDP

Fill in:

- Nominal GDP = quantities $\times$ **current** prices
- Real GDP = quantities $\times$ **base-year (constant)** prices
- The GDP deflator $= \dfrac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$

Türkiye example: In 2022, Türkiye's nominal GDP grew $\sim$100% year-on-year, but real GDP grew only $\sim$5.5%. The rest was inflation — the GDP deflator roughly doubled.

The AD Curve — What & Why?

Aggregate Demand curve: price level on the vertical axis, **real** GDP demanded on the horizontal axis.

Why does it slope downward? Three effects (ceteris paribus):

1. **Wealth effect**: higher $P \Rightarrow$ real value of cash/savings **???** $\Rightarrow$ C falls.
2. **Interest rate effect**: higher $P \Rightarrow$ more money demand $\Rightarrow$ interest rate **???** $\Rightarrow$ I falls.
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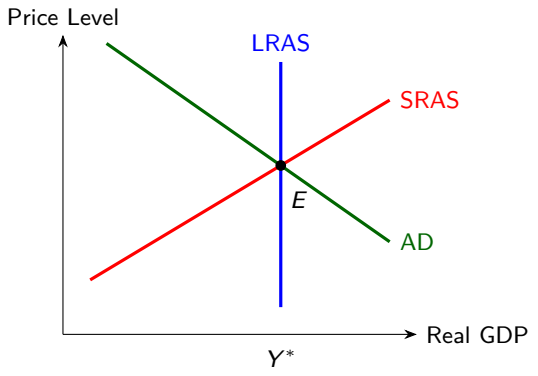
Key distinction from 101: In 101, demand slopes down because consumers substitute *between goods*. Here there's no "other good", it's the **whole economy**.

The AS Curves — Short Run vs. Long Run

Long-Run AS (LRAS):

- Shape: **???**
- At **potential GDP** (full employment).
- Price level doesn't affect how much the economy *can* produce with given K, L, technology.



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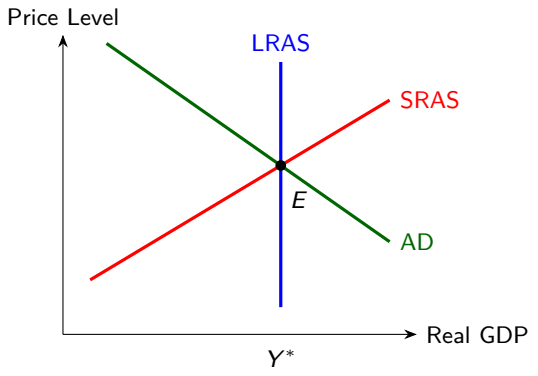

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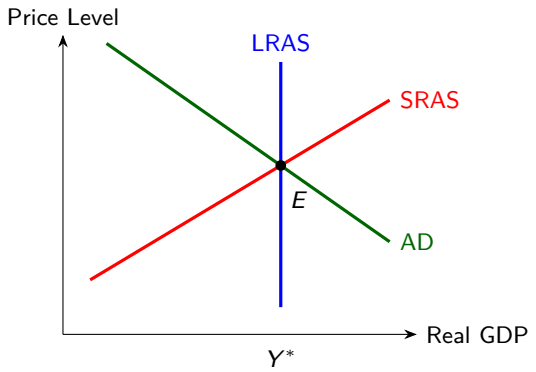

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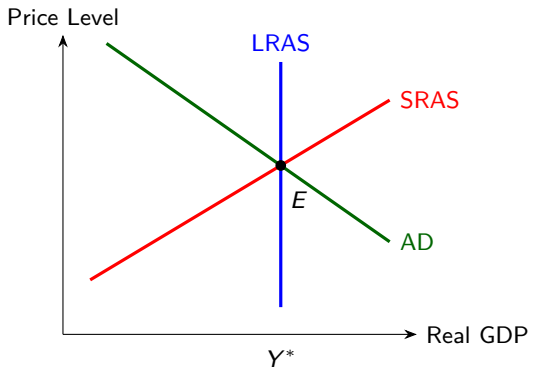

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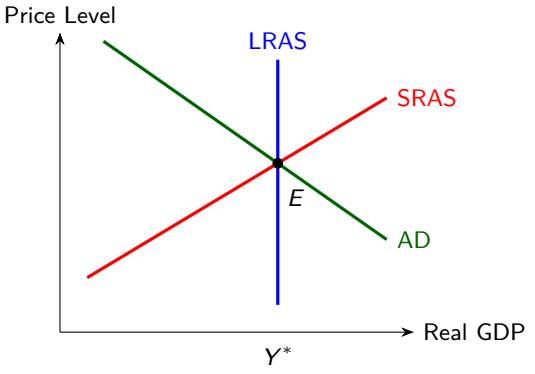
Short-Run AS (SRAS):

- Shape: **upward-sloping**
- Why? Sticky wages & prices, menu costs, contracts.
- If P rises but wages don't $\Rightarrow$ profits $\uparrow$ $\Rightarrow$ firms produce more.



What Shifts What?

Variable Change	AD	SRAS
↑ Government purchases	???	—
↑ Interest rates (Fed)	???	—
↑ Consumer/firm optimism	???	—
↑ Oil prices (unexpected)	—	???
↑ Productivity / technology	—	???
↑ Expected future price level	—	???

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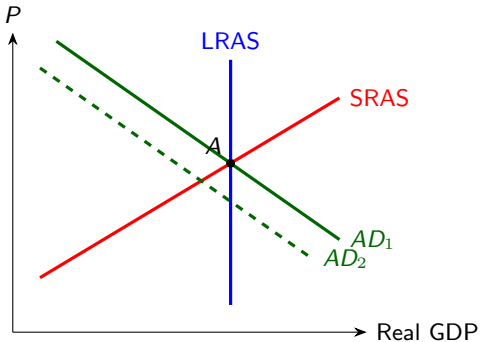
Rule of thumb:

- Anything that changes *spending* at a given price level ⇒ shifts **AD**.
- Anything that changes *production costs* or capacity ⇒ shifts **SRAS** (or LRAS).

Scenario 1: Recession — AD Shifts Left

Story: Households become pessimistic; consumption & investment fall.



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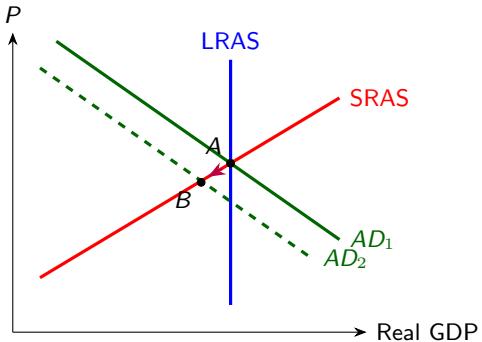

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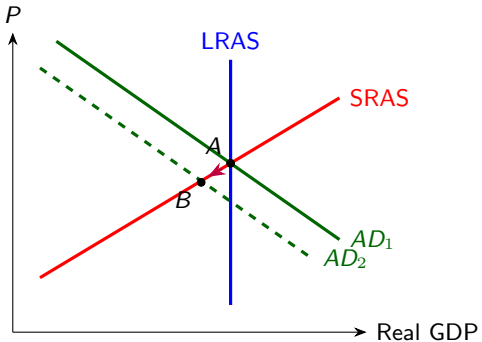

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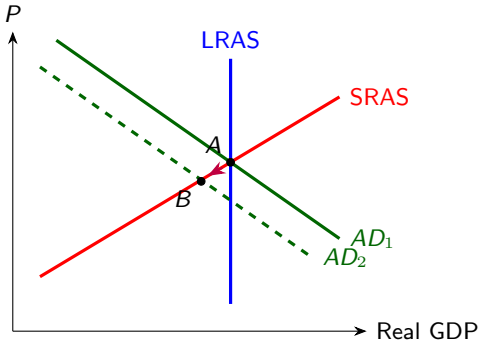

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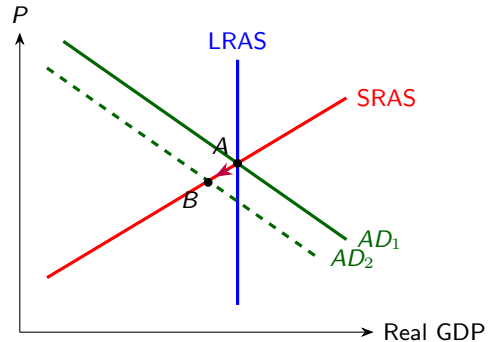

Short run (at B):

- Real GDP: **falls**
- Price level: **falls**
- Unemployment: **rises**

Long run: SRAS shifts right as wages adjust down $\Rightarrow$ economy returns to Y^* at a lower P.

Long Term Adjustment: Recession Recovery

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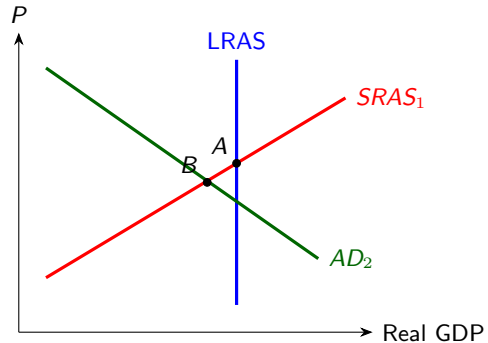

The mechanism:

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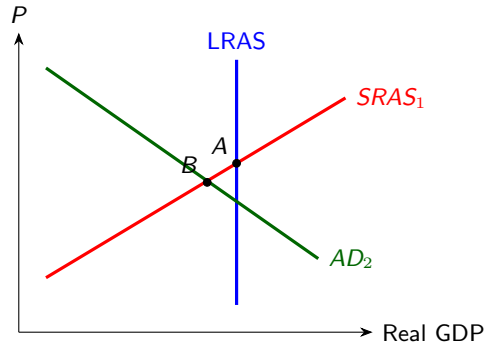

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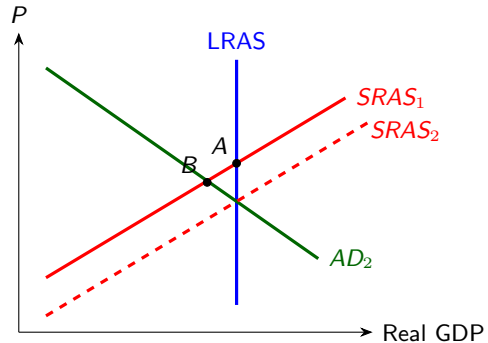

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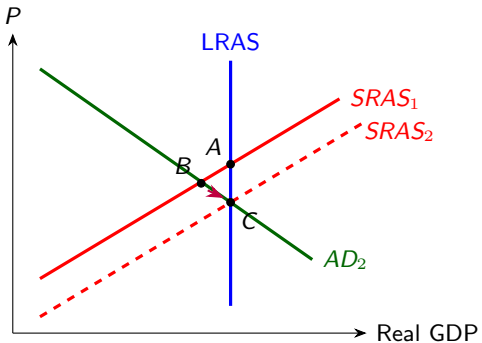

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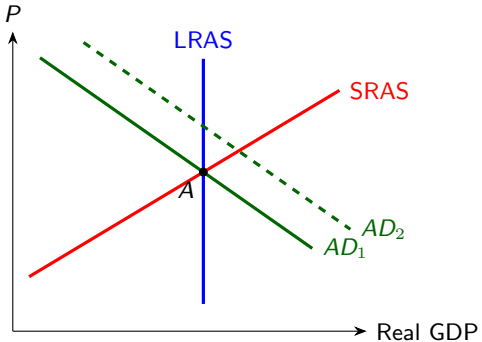

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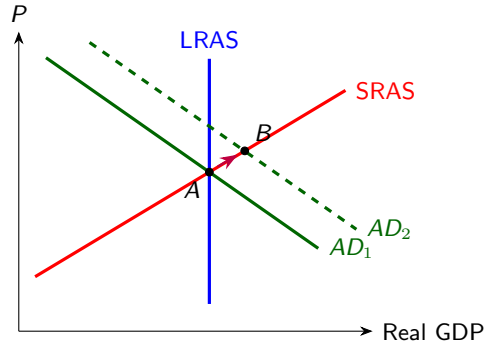

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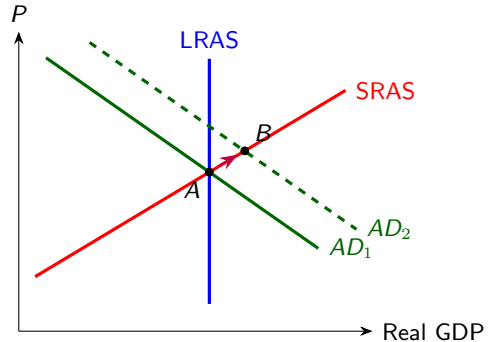

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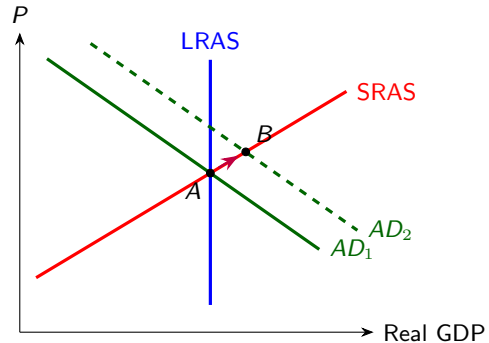

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Long run: SRAS shifts left (rising wages) until $Y = Y^*$ at a *higher* P.

Why Does Overheating $\Rightarrow$ Inflation? (Phillips Curve Preview)

$$Y > Y^* \xrightarrow{?} \text{???} \xrightarrow{?} \text{???} \Rightarrow \text{???}$$

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This is the Phillips Curve intuition:

$$Y > Y^* \Leftrightarrow u < u^* \Rightarrow \textbf{inflation accelerates.}$$

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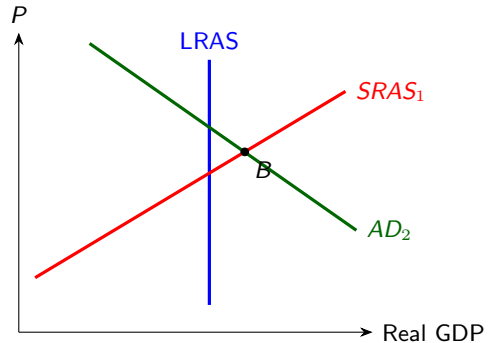
Türkiye, 2021–2023:

- CBRT cut policy rates aggressively despite rising demand ⇒ AD kept shifting right.
- Economy ran hot ($Y > Y^*$), labor markets tight.
- Result: inflation peaked above 80% (Oct 2022).
- Textbook overheating — AD outrunning the economy's capacity.

Long Term Adjustment: Cooling an Overheated Economy

Starting point: Economy at B after AD shifted right.



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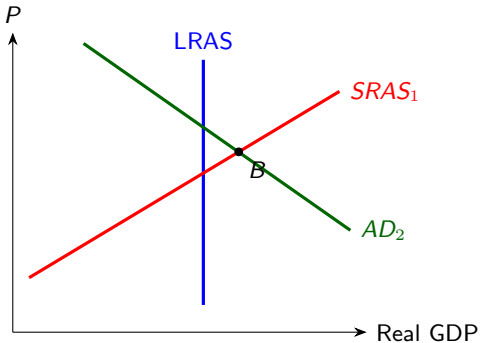

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Workers have bargaining power $\Rightarrow$ **???**

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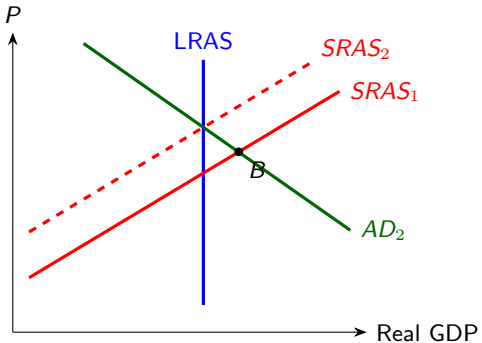

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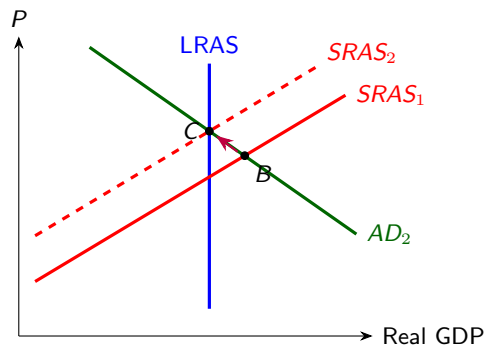

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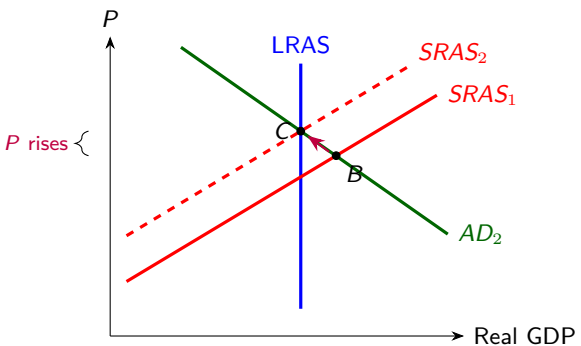


The mechanism:

At B, $Y > Y^*$.
Labor market is **tight** (Unemployment rate is low than natural level) ($u < u^*$).

Workers have bargaining power $\Rightarrow$ **wages rise**.

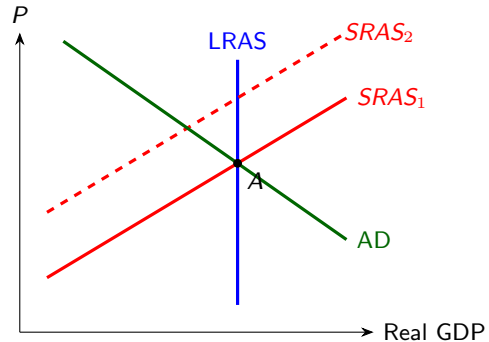
$\Rightarrow$ Production costs increase.
$\Rightarrow$ SRAS shifts **left**.

New LR equilibrium at C:

- Y returns to Y^*
- P is *higher* than at A or B

Scenario 3: Supply Shock — SRAS Shifts Left

Story: Unexpected oil price spike.



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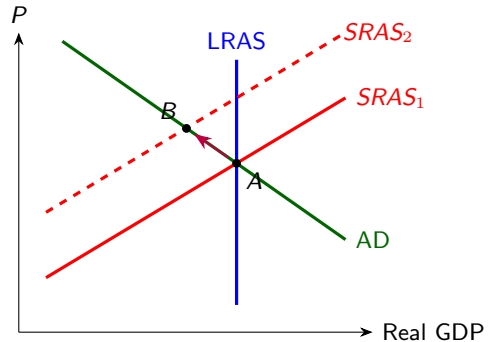

At B:

- Real GDP: **???**
- Price level: **???**

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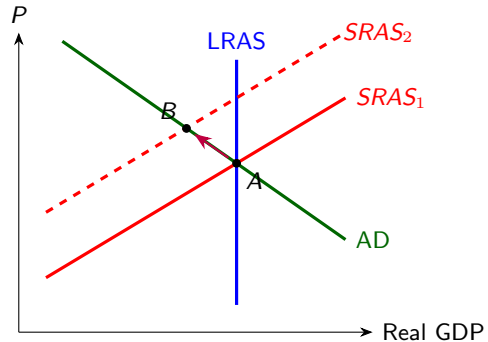

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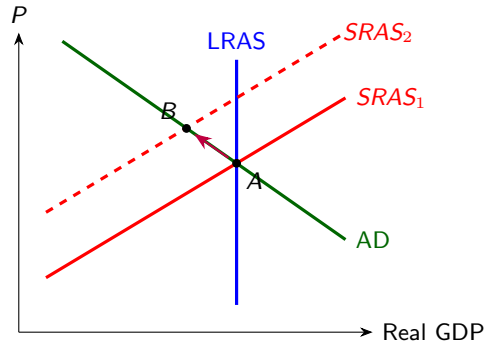

At B:

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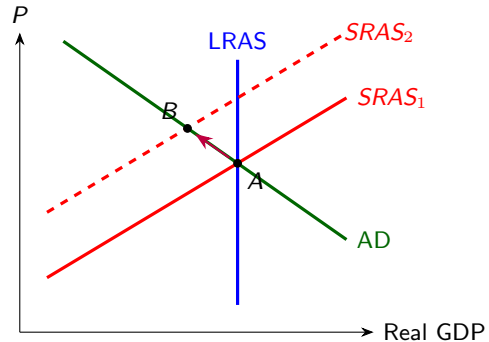

At B:

- Real GDP: **falls**
- Price level: **rises**

This ugly combo is called: **???**

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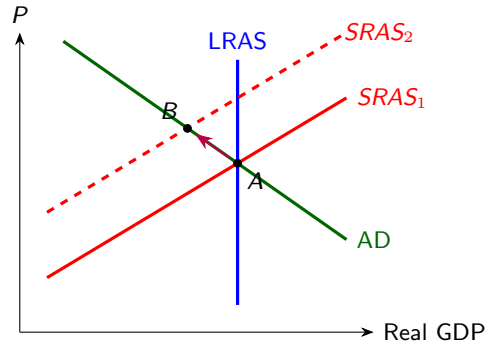


At B:

- Real GDP: **falls**
- Price level: **rises**

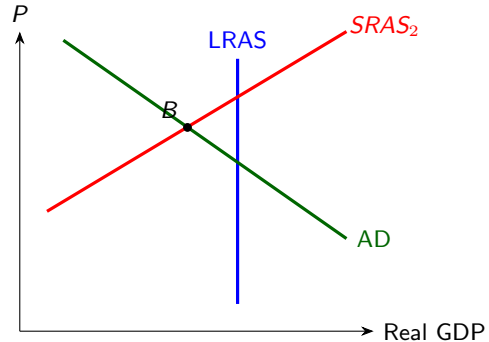
This ugly combo is called: **stagflation**

(stagnation + inflation)

Historical: OPEC 1973 oil embargo; 2022 energy crisis post-Russia/Ukraine.

Long Term Adjustment: After a Supply Shock

Starting point: Economy at B after SRAS shifted left. Stagflation.



At B: unemployment is high.

What happens to wages over time?

???

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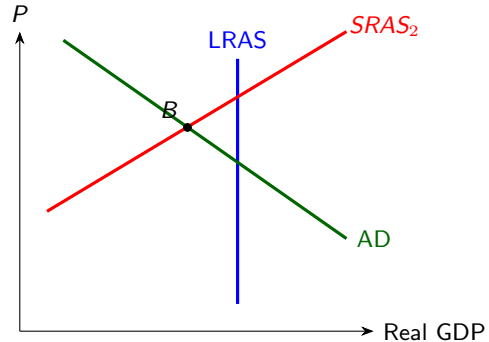

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Wages gradually **fall** as workers compete for scarce jobs.

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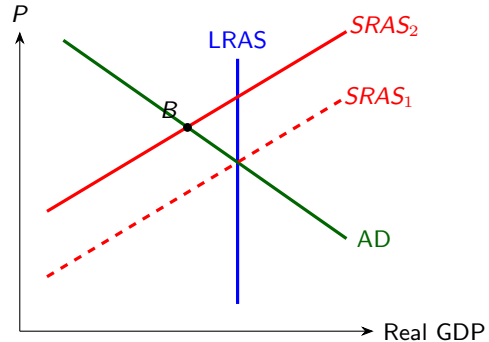

At B: unemployment is high.

Wages gradually **fall** as workers compete for scarce jobs.

$\Rightarrow$ Costs decline.
$\Rightarrow$ SRAS shifts back **right**.

Economy returns to A at original P.

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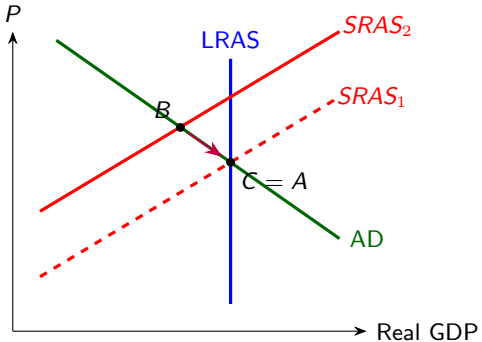

At B: unemployment is high.

Wages gradually **fall** as workers compete for scarce jobs.

$\Rightarrow$ Costs decline.
$\Rightarrow$ SRAS shifts back **right**.

Economy returns to A at original P.

Timeline: Long term correction after supply shocks is the *slowest* of all cases. Politically, governments rarely wait.

Scenario 4: Minimum Wage Hike — Both Curves Shift!

Story: Government raises the minimum wage significantly.

Question: Which curve(s) shift, and in which direction?

Scenario 4: Minimum Wage Hike — Both Curves Shift!

Story: Government raises the minimum wage significantly.

Supply side (SRAS $\leftarrow$):

- Higher wages = higher production costs.
- Firms need higher prices to supply the same output.
- SRAS shifts **left**.

Demand side (AD $\rightarrow$):

- Low-wage workers have high MPC.
- Their income rises $\Rightarrow$ consumption rises.
- AD shifts **right**.

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Net effect:

- Price level: **???** (both shifts push P up.)
- Real GDP: **???** (depends on which shift dominates.)

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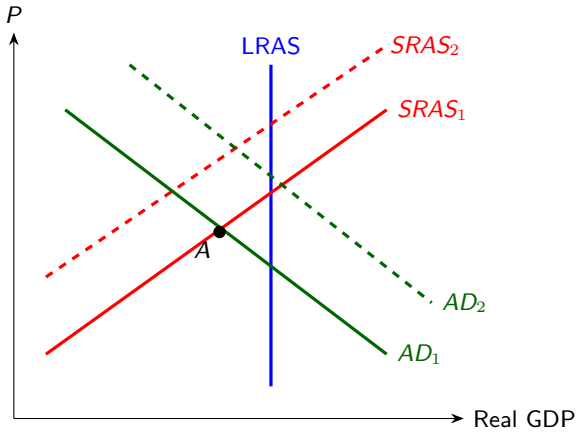
Net effect:

- Price level: **unambiguously rises** (both shifts push P up.)
- Real GDP: **ambiguous** (depends on which shift dominates.)

Scenario 4: Minimum Wage — The Graph



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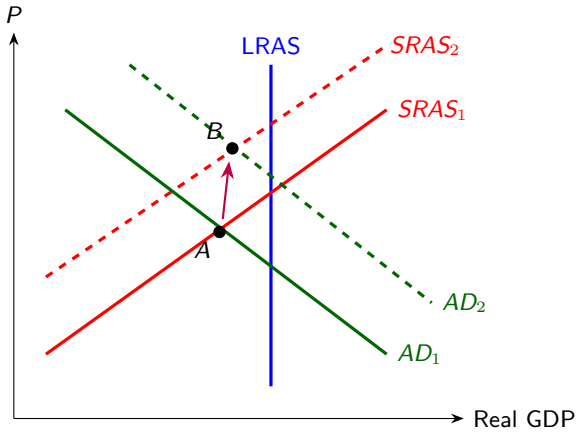

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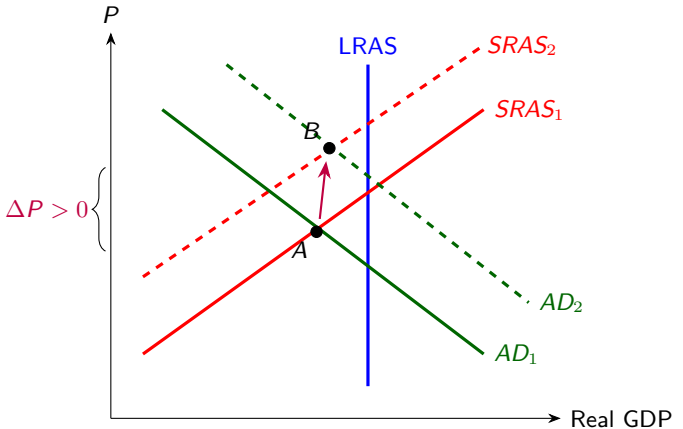

Conclusion: Minimum wage hike shifts *both* curves. Price level unambiguously rises; output effect is ambiguous.