Why not just print more money?

The quantity equation, why printing brings higher prices, and the Phillips curve: the short-run trade-off and why it fades.

1 Quantity equation

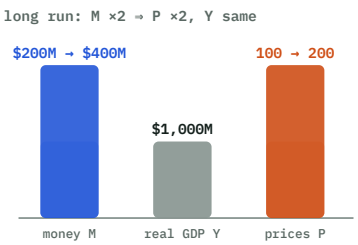
money × times spent

- `M × V = P × Y` · M money · V velocity · P price level · Y real GDP · P × Y = **nominal GDP**
- **Velocity** = times a year the average dollar is spent · `V = nominal GDP ÷ M`
- Coralia: $200M × **5** = $1,000M · M $300M ⇒ $1,500M ⇒ P 150 (fish $20 → $30)

2 Money is neutral

long run: prices, not output

- V and Y steady ⇒ **P moves in proportion to M** · M $400M ⇒ nominal GDP $2,000M ⇒ **P 200** ⇒ bread $4 → $8
- +10% money ⇒ +10% prices ($220M ⇒ P 110) · +25% ⇒ P 125 (M $250M, bread $5)
- Printing adds dollars, **not** boats, fish, workers ⇒ Y stays $1,000M



3 Rates and hyper

inflation in % a year

- `inflation ≈ money growth − real GDP growth` · 5% − 2% = **3%** · 0% inflation ⇒ money grows 2%
- **Hyperinflation** = prices +50% or more a month · Zimbabwe 2008: M ↑↑, Y ↓ ⇒ P doubles a day ⇒ spend at once ⇒ V ↑ ⇒ worse
- **Inflation tax** = printing to pay bills ⇒ every dollar held buys less ⇒ central banks kept separate from the government

4 Short run

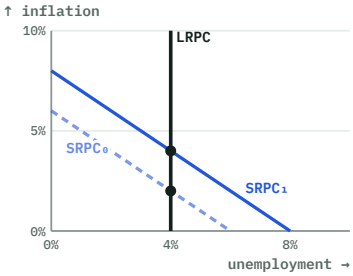
a boom, then prices

- Chain: M +$20M ⇒ rate ↓ ⇒ **AD right** (aggregate demand = total spending) ⇒ Y $1,020M above potential (normal full output), P 105 ⇒ unemployment < 4%
- Wages catch up ⇒ **SRAS left** (short-run supply: costs ↑) ⇒ Y back to $1,000M, P **110** (M +$40M: $1,040M at P 110 ⇒ $1,000M at P 120)
- Short run: more money ⇒ more output **and** higher prices · long run: only prices

5 Phillips curves

inflation vs unemployment

- **A. W. Phillips** (New Zealand economist, 1958): UK years of low unemployment = fast-rising wages ⇒ prices follow · π inflation · u unemployment · e expected inflation
- **SRPC** (short-run Phillips curve) slopes down: u ↓ ⇒ π ↑ · `π = e + (4 − u)` · e = 2: u 4% ⇒ 2% · u 2% ⇒ 4% · u 6% ⇒ 0%
- **AD shift** ⇒ island moves **along** the SRPC (AD right: up and left)
- **LRPC** (long-run Phillips curve) vertical at the natural rate (u = 4%: normal unemployment at potential) ⇒ no long-run trade-off
- Expected inflation e ↑ ⇒ **SRPC shifts up**: e 2% → 4% ⇒ at u 4%, π = 4% · e 4% → 2% ⇒ SRPC down, π = 2%



6 Shocks and graphs

what moves what

CHANGE	AD/AS	PHILLIPS
AD right / left	AD moves	along SRPC
Fuel price ↑ (SRAS left)	SRAS moves	SRPC up: u 5%, π 3%
Fuel price ↓ (SRAS right)	SRAS moves	SRPC down: both better
Expected inflation ↑ / ↓	SRAS follows wages	SRPC up / down

- **Stagflation** = high inflation and high unemployment together (supply shock)
- Watch out: more money ⇒ richer island? **No** · AD moves the island **along** the SRPC, expectations and supply shocks move the **curve** · inflation ≈ money growth **minus** real growth