



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.

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Quantity equation

money × times spent

- $M \times V = P \times Y$ · M money · V velocity · P price level · Y real GDP · $P \times Y = \text{nominal GDP}$
- **Velocity** = times a year the average dollar is spent · $V = \text{nominal GDP} \div M$
- Coralia: $\$200M \times 5 = \$1,000M$ · M $\$300M \Rightarrow \$1,500M \Rightarrow P 150$ (fish $\$20 \rightarrow \30)

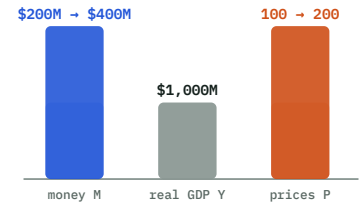
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Money is neutral

long run: prices, not output

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

long run: $M \times 2 \Rightarrow P \times 2$, Y same



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Rates and hyper

inflation in % a year

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

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Short run

a boom, then prices

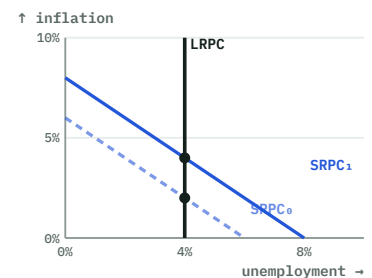
- Chain: M $+\$20M \Rightarrow$ rate $\downarrow \Rightarrow$ **AD right** $\Rightarrow$ Y $\$1,020M$ above potential, P 105 $\Rightarrow$ unemployment $< 4\%$
- Wages catch up $\Rightarrow$ **SRAS left** $\Rightarrow$ Y back to $\$1,000M$, P **110** (M $+\$40M$: $\$1,040M$ at P 110 $\Rightarrow$ $\$1,000M$ at P 120)
- Short run: more money $\Rightarrow$ more output **and** higher prices · long run: only prices

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Phillips curves

inflation vs unemployment

- **SRPC** slopes down: $u \downarrow \Rightarrow \pi \uparrow$ · $\pi = e + (4 - u)$ · $e = 2$: $u 4\% \Rightarrow 2\%$ · $u 2\% \Rightarrow 4\%$ · $u 6\% \Rightarrow 0\%$
- **AD shift** $\Rightarrow$ island moves **along** the SRPC (AD right: up and left)
- **LRPC** vertical at the natural rate ($u = 4\%$) $\Rightarrow$ no long-run trade-off
- Expected inflation $e \uparrow \Rightarrow$ **SRPC shifts up**: $e 2\% \rightarrow 4\% \Rightarrow$ at $u 4\%$, $\pi = 4\%$ · $e 4\% \rightarrow 2\% \Rightarrow$ SRPC down, $\pi = 2\%$



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Shocks and graphs

what moves what

CHANGE	AD/AS	PHILLIPS
AD right / left	AD moves	along SRPC
Fuel price $\uparrow$ (SRAS left)	SRAS moves	SRPC up: $u 5\%$, $\pi 3\%$
Fuel price $\downarrow$ (SRAS right)	SRAS moves	SRPC down: both better
Expected inflation $\uparrow / \downarrow$	SRAS follows wages	SRPC up / down

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