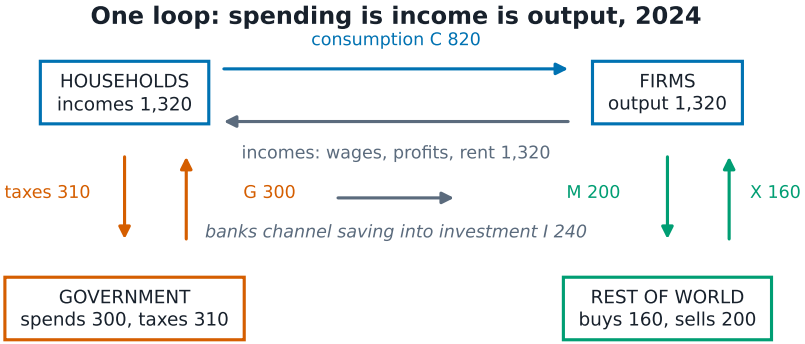
Principles of Macroeconomics

Curated undergraduate study track (not accredited, no external exam). Original explanations and practice only, following the reviewed course handout.

Aurora, one decade of data

- One small open economy carries the whole course - its accounts tie on both sides, every year.
- Every worked number is **machine-verified**; every model states its limits.

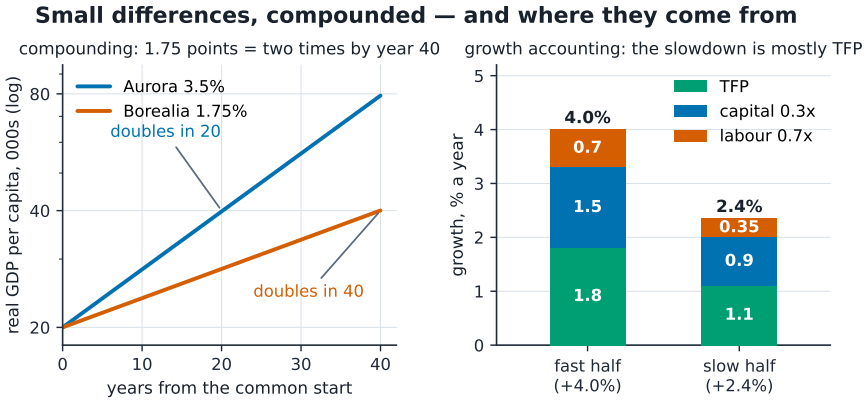
National accounts: the loop closes at 1,320



$C + I + G + X - M = 1{,}320$, and income closes at the same 1,320.

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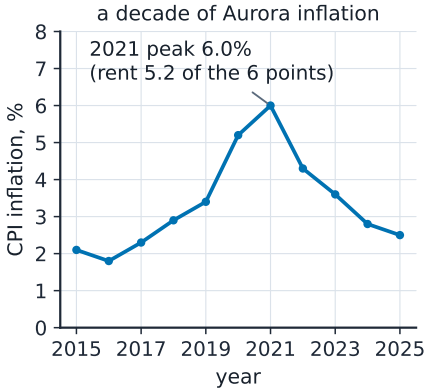
Growth: small rates, compounded

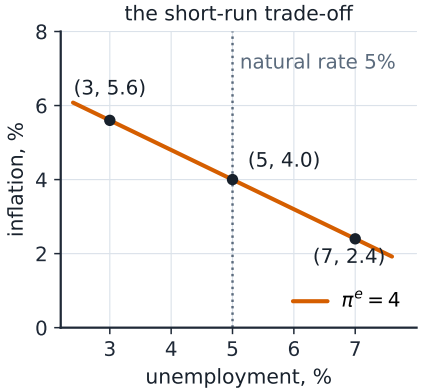


On a log scale, 3.5% growth doubles in 20 years, 1.75% in 40.

Inflation: audit the index

Prices and jobs: an index you can audit, a trade-off that expires





CPI 106.0 means 6% **inflation**; the trade-off holds until expectations move.

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Money: born on a balance sheet

Each round lends 90% of the new deposit

Round 1

reserves	+100
deposits	+100
lends	90

Round 2

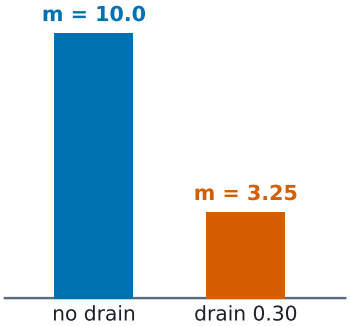
reserves	+90
deposits	+90
lends	81

Round 3

reserves	+81
deposits	+81
lends	72.9

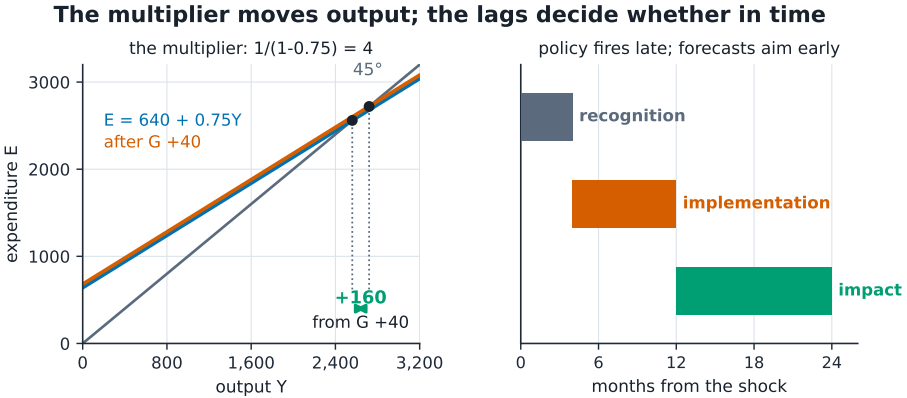
deposits so far 271; the chain runs to 1,000

From the same 100 of reserves



A 10% **reserve ratio** turns 100 into 1,000; household cash cuts it to 325.

Policy: the cross and the clock



G +40 becomes +160 at MPC 0.75, if the lags let it arrive in time.

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Policy: the multiplier and the clock

1. **Close** Gap -60 at MPC 0.75: G +15 (x4) or T -20 (x3) each deliver +60 - arithmetic offers the choice.
2. **Limits Crowding out**, import leakages and supply slack make the real **multiplier** smaller than 4 - state the model.
3. **Clocks** Recognition, implementation, impact: monetary fires fast and lands slow; fiscal the reverse.

International: the ledger closes

The ledger closes: -35 is financed

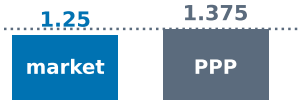
CURRENT ACCOUNT		FINANCIAL ACCOUNT	
trade (X - M)	-40	foreign saving	+35
net income	+8	**balance**	**+35**
transfers	-3		
current account balance	**-35**		

CA = S - I: investment exceeds national saving by exactly 35

The pound against parity

USD per GBP

market below parity:
the pound looks cheap,
imports dear



A **current account** of -35 met by +35 of foreign saving: CA = S - I.

National accounts: one number, three readings

1. **Level** Nominal 1,320 against real 1,100: deflator 120.0 - prices did 20 points of the 32.
2. **People** Population 10.0 to 10.4 million: real per person 100 to 105.8 - the honest growth figure.
3. **Double** Mill sells 50 of flour, bakery sells 200 of bread: count 200 once - or 50 + 150 of **value added**.

Growth accounting: weigh, then wonder

1. **Fast** Y +4.0 with K +5.0 and L +1.0: TFP = 4.0 - 1.5 - 0.7 = 1.8%.
2. **Slow** Y +2.4 with K +3.0 and L +0.5: TFP = 1.15% - the slowdown is two-thirds residual.
3. **Compound** 3.5% doubles in 20 years, 1.75% in 40: a two-times gap by year 40.

Inflation: the Fisher trap

1. **Index** Basket 920 to 975: CPI 106.0, **inflation** 6.0%, rent 5.22 of the points.
2. **Fisher** 5% nominal, 3% inflation: real 1.05/1.03 - 1 = 1.94%, not 2.0%.
3. **Surprise** Inflation lands 6: real 1.05/1.06 - 1 = -0.94% - the saver paid for it.

Money: the interlocking tools

1. **Chain** 100 of reserves at a tenth: 100, 90, 81... deposits run to 1,000.
2. **Leak** Cash drain 0.3: $m = 1.3/0.4 = 3.25$, so 325 - real multipliers are 3-ish.
3. **Tools** A 10 open-market sale at $m = 3.25$ drains 32.5 of money.

International: read the deficit properly

1. **Ledger** X-M -40, income +8, transfers -3: CA -35 met by +35 of foreign saving.
2. **Parity** Basket 800 at home, 1,100 abroad: PPP 1.375; the market 1.25 makes the pound cheap.
3. **Model** Aurora 5%, world 4%: UIP expects 1.25 x 1.04/1.05 = 1.238 - and carry traders bet it fails.

Check yourself

- GDP from both sides? (C+I+G+X-M = income side = 1,320.)
- TFP in the fast half? (4.0 - 1.5 - 0.7 = 1.8%.)
- The 2021 basket? (CPI 106.0, **inflation** 6.0, rent 5.22 points.)
- The multipliers at MPC 0.75, and the -60 gap? (4 and -3; G+15 or T-20.)