Where does money come from?

Money, a bank's books, and how one deposit becomes many: loans, the money multiplier, its leaks and bank runs.

1 Money

what it is, what counts

- **Barter** = swap goods directly ⇒ needs each side to want what the other has (fish ⇄ bread fails if baker wants a haircut) ⇒ money solves it
- 3 jobs: **medium of exchange** (pay) · **unit of account** (prices, debts) · **store of value** (keep for later)
- **Commodity money** (shells, gold) has value of its own · **fiat money** ($10 note) has none: law + trust ⇒ everyone accepts it
- `M1` = cash + checking deposits (spend today) · `M2` = M1 + savings + time deposits (locked for a fixed time) ⇒ M2 contains all of M1

2 Bank's books

T-account, reserves

- **T-account**: assets (what it owns) left = liabilities (what it owes) right · you deposit $1,000 ⇒ reserves $1,000 | deposits $1,000
- **Required reserves** = `reserve ratio × deposits` · ratio 10% ⇒ $100 · set by the central bank (Bank of Coralia = bank for banks)
- **Excess reserves** = reserves − required = what it can lend ⇒ $1,000 − $100 = **$900**

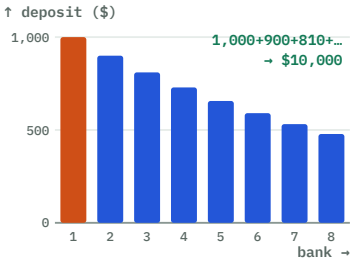
after lending the $900

ASSETS	LIABILITIES
Reserves $100 Loans $900	Deposits $1,000

3 Deposit chain

a loan creates money

- Loan $900 ⇒ boatyard pays sailmaker ⇒ she **deposits** at bank 2 ⇒ deposit = **new money** (deposits are M1) ⇒ bank 2 keeps 10%, lends $810 ⇒ …
- Deposits: 1,000 → 900 → 810 → 729 → … each = 0.9 × the last ⇒ total → **$10,000**, not ∞
- New money = total − first deposit (already money) = **$9,000** = 10 × $900 of excess reserves
- Cash at home, never deposited ⇒ chain stops



4 Multiplier

1 ÷ reserve ratio

- `money multiplier = 1 ÷ reserve ratio` · `total deposits = multiplier × first deposit` · ratio ↑ ⇒ multiplier ↓

RATIO	MULTIPLIER	$1,000 ⇒ DEPOSITS	NEW MONEY
10%	10	$10,000	$9,000
20%	5	$5,000	$4,000
25%	4	$4,000	$3,000
50%	2	$2,000	$1,000

- Example $800, ratio 25%: keep **$200** ⇒ lend **$600** ⇒ ×4 = **$3,200** deposits ⇒ new money **$2,400**
- Backwards: $1,000 → $5,000 ⇒ multiplier 5,000 ÷ 1,000 = 5 ⇒ ratio 1 ÷ 5 = **20%** · cut ratio 20% → 10% ⇒ ceiling doubles

5 Leaks

why real ≠ formula

- **Cash leak**: people keep cash, never deposited ⇒ no bank can lend it again
- **Extra reserves**: banks keep more than required (20% instead of 10%) ⇒ multiplier 5, not 10 · US set the requirement to 0 in 2020
- ⇒ `1 ÷ ratio` is only a **ceiling**, not what always happens

6 Bank runs

fractional reserves

- **Fractional-reserve banking**: keep a fraction as reserves, lend the rest ⇒ cash covers only $100 per $1,000
- **Bank run** = many depositors withdraw at once, afraid it will fail ⇒ the fear can make it fail
- Example: deposits $2,000, reserves $200 · 30% of deposits withdrawn = $600 ⇒ short **$400** · loans $1,800 cannot come back overnight
- Cures: **deposit insurance** = government repays deposits up to a limit (US: $250,000) · central bank lends cash to a healthy bank in a hurry
- Real case: Silicon Valley Bank, March 2023 ⇒ ~$42 bn asked in one day, most deposits above the insured limit ⇒ closed next morning
- Watch out: new money ($9,000) ≠ total deposits ($10,000) · the multiplier is a ceiling · reserves are cash, not the loans