



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.

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Money

what it is, what counts

- **Barter** = swap goods directly $\Rightarrow$ needs each side to want what the other has (fish $\nrightarrow$ bread fails if baker wants a haircut) $\Rightarrow$ 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 $\Rightarrow$ everyone accepts it
- **M1** = cash + checking deposits (spend today) · **M2** = M1 + savings + time deposits (locked for a fixed time) $\Rightarrow$ M2 $\supset$ M1

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Bank's books

T-account, reserves

- **T-account**: assets (what it owns) left = liabilities (what it owes) right · you deposit \$1,000 $\Rightarrow$ reserves \$1,000 | deposits \$1,000
- **Required reserves** = $\text{reserve ratio} \times \text{deposits}$ · ratio 10% $\Rightarrow$ \$100 · set by the central bank (Bank of Coralía = bank for banks)
- **Excess reserves** = reserves – required = what it can lend $\Rightarrow$ \$1,000 – \$100 = \$900

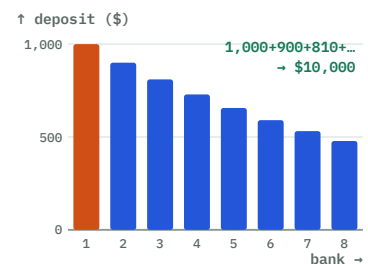
ASSETS	LIABILITIES
Reserves \$100	Deposits \$1,000
Loans \$900	

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Deposit chain

a loan creates money

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



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Multiplier

$1 \div \text{reserve ratio}$

- **money multiplier** = $1 \div \text{reserve ratio}$ · **total deposits** = multiplier $\times$ first deposit · ratio $\uparrow \Rightarrow$ multiplier $\downarrow$
- Example \$800, ratio 25%: keep **\$200** $\Rightarrow$ lend **\$600** $\Rightarrow \times 4 =$ **\$3,200** deposits $\Rightarrow$ new money **\$2,400**
- Backwards: \$1,000 $\rightarrow$ \$5,000 $\Rightarrow$ multiplier $5,000 \div 1,000 = 5 \Rightarrow$ ratio $1 \div 5 =$ **20%** · cut ratio 20% $\rightarrow$ 10% $\Rightarrow$ ceiling doubles

RATIO	MULTIPLIER	\$1,000 $\Rightarrow$ 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

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Leaks

why real $\neq$ formula

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

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Bank runs

fractional reserves

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