



Where does a dollar go?

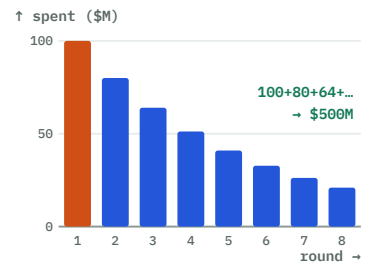
A government dollar is spent again and again: the multiplier, taxes, and how spending and taxes close gaps.

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Ripple

one dollar, many rounds

- Spending = income: government pays builders \$100M $\Rightarrow$ builders spend $\Rightarrow$ bakers earn $\Rightarrow$ bakers spend... **multiplier effect**
- MPC** (marginal propensity to consume) = share of each extra \$ spent · Coralia
 $0.8 \cdot \text{MPS}$ = share saved · $\text{MPC} + \text{MPS} = 1 \Rightarrow 0.2$
- Rounds: $100 \rightarrow 80 \rightarrow 64 \rightarrow 51.2 \rightarrow \dots$ each = $0.8 \times$ the last $\Rightarrow$ total $\rightarrow$ **\$500M**, not ∞
 · saving = **leak**



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Spending multiplier

government spending G

- multiplier** = $1 \div (1 - \text{MPC}) = 1 \div \text{MPS}$ · $\Delta \text{GDP} = \text{multiplier} \times \Delta G$
- MPC 0.8 $\Rightarrow 1 \div 0.2 = 5 \cdot \$100\text{M} \Rightarrow \500M

MPC	MPS	MULTIPLIER	\$100M $\Rightarrow$
0.5	0.5	2	\$200M
0.6	0.4	2.5	\$250M
0.75	0.25	4	\$400M
0.8	0.2	5	\$500M
0.9	0.1	10	\$1,000M

- MPC $\uparrow \Rightarrow$ multiplier $\uparrow$ · find MPC backwards: total $\div$ first round = $2.5 \Rightarrow 1 - \text{MPC} = 1 \div 2.5 = 0.4 \Rightarrow \text{MPC} = 0.6$

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Taxes

smaller than G

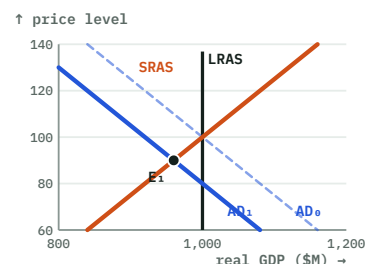
- Tax cut: families **save part first** $\Rightarrow$ round 1 = MPC $\times$ cut (not the full cut)
- tax multiplier** = $-\text{MPC} \div (1 - \text{MPC}) = -0.8 \div 0.2 = -4$ · minus: taxes $\downarrow \Rightarrow$ GDP $\uparrow$ · cut \$100M $\Rightarrow 4 \times 100 = +\$400\text{M} < G: +\$500\text{M}$
- Example MPC 0.75: school \$60M $\Rightarrow 4 \times 60 = \240M · tax cut \$60M $\Rightarrow 4 \times (0.75 \times 60 = 45) = \180M (multiplier -3)
- Balanced budget:** G $\uparrow$ \$100M and taxes $\uparrow$ \$100M $\Rightarrow +500 - 400 = +\100M · multiplier = 1

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Closing gaps

fiscal policy on AD/AS

- RECESSIONARY GAP** real GDP < potential $\Rightarrow$ **expansionary:** G $\uparrow$ or taxes $\downarrow \Rightarrow$ AD $\rightarrow$
 · **INFLATIONARY GAP** real GDP > potential $\Rightarrow$ **contractionary:** G $\downarrow$ or taxes $\uparrow \Rightarrow$ AD $\leftarrow$
- How much: $\Delta G = \text{AD shift} \div \text{spending multiplier}$ ·
 $\Delta \text{taxes} = \text{AD shift} \div \text{tax multiplier}$
- Tourists -80 $\Rightarrow$ real GDP 960M, gap 40 · AD must go $\rightarrow 80 \Rightarrow \Delta G = 80 \div 5 =$
\$16M (more than gap $\div 5$, price level rises) · shock -40 $\Rightarrow$ tax cut $40 \div 4 =$ **\$10M**
 (or G: $40 \div 5 = \$8\text{M}$)



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Stabilizers

no vote needed

- Automatic stabilizers** = taxes and benefits that change by themselves with the cycle
- Recession $\Rightarrow$ pay $\downarrow \Rightarrow$ income tax $\downarrow$ · unemployment benefits $\uparrow \Rightarrow$ jobless still spend $\Rightarrow$ AD falls **less** · boom $\Rightarrow$ the opposite
- Versus new laws (spending plans, tax changes): slow $\Rightarrow$ **time lags**

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Limits

why real $\neq$ formula

- Time lags:** see the recession, vote, build $\Rightarrow$ years · harbor opens late, in a boom $\Rightarrow$ AD $\uparrow$ above potential $\Rightarrow$ prices $\uparrow$
- Leaks:** each round also pays taxes and buys imports $\Rightarrow$ multiplier $< 1 \div (1 - \text{MPC})$
- Crowding out:** government borrows $\Rightarrow$ interest rates $\uparrow$ (price of a loan) $\Rightarrow$ firms borrow, invest $\downarrow \Rightarrow$ boost partly taken back (Lesson 8)
- Real case: US 2009, ~\$800bn plan · estimated spending multiplier ≈ 0.5 –2.5 · economists disagree
- Watch out: \$100M of tax cut $\neq$ \$100M of spending: part is saved $\Rightarrow$ smaller effect · and the multiplier 5 is only the simple formula