(Triple the Awesomeness!!!)

Multipliers

Coach Burnett
AP Macroeconomics

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Disposable Income

- This is also known as your:
  - Net Income
  - Paycheck
  - After tax income

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Marginal Propensity to Consume (MPC)

- The fraction of any change in disposable income that is consumed.
- MPC = $\frac{\text{Change in Consumption}}{\text{Change in Disposable Income}}$
- MPC = $\Delta C / \Delta DI$

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Marginal Propensity to Save (MPS)

- The fraction of any change in disposable income that is saved.
- MPC = $\frac{\text{Change in Saving}}{\text{Change in Disposable Income}}$
- MPC = $\Delta S / \Delta DI$

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Marginal Propensities

- MPC + MPS = 1

  .: MPC = 1 – MPS

  .: MPS = 1 – MPC

- Remember, people do two things with their disposable income, consume or save!

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The Spending Multiplier Effect

- An initial change in spending (C, I_G, G, X_N) causes a larger change in aggregate spending, or Aggregate Demand (AD).
- Multiplier = $\frac{\text{Change in AD}}{\text{Change in Spending}}$
- Multiplier = Δ AD / Δ C, I_G, G, or X_N

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The Spending Multiplier Effect

- Why does this happen?
  - Expenditures and income flow continuously which sets off a spending increase in the economy.

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The Spending Multiplier Effect

- Ex. If the government increases infrastructure spending by $10 Billion, then contractors will hire and pay more workers, which will increase aggregate spending by more than the original $10 Billion.

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Calculating the Tax Multiplier

- The Spending Multiplier can be calculated from the MPC or the MPS.
- Multiplier = $^{1}/_{1\text{-MPC}}$ or $^{1}/_{\text{MPS}}$
- Multipliers are (+) when there is an increase in spending and (–) when there is a decrease.

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Calculating the Tax Multiplier

- Ex. If the government decides to increase taxes by $500 Billion, then disposable income will fall, which will decrease short-run aggregate supply by more than the original $500 Billion.

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MPS, MPC, & Multipliers

- When the government taxes, the multiplier works in reverse
- Why?
  - Because now money is leaving the circular flow
- Tax Multiplier (note: it's **NEGATIVE**)

$$= {}^{-\text{MPC}}/_{1\text{-MPC}} \text{ or } {}^{-\text{MPC}}/_{\text{MPS}}$$

- If there is a tax **CUT**, then the multiplier is +, because there is now more money in the circular flow.

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MPS, MPC, & Multipliers

- Ex. Assume U.S. citizens spend 95¢ for every extra $1 they earn. Further assume that the real interest rate (r%) decreases, causing a $100 billion increase in gross private investment. Calculate the effect of a $50 billion increase in I_G on U.S. Aggregate Demand (AD).
  - Step 1: Calculate the MPC and MPS
    - MPC = $^{\Delta C}/_{\Delta DI}$ = $^{.95}/_{1}$ = ***.95***
    - MPS = 1 – MPC = ***.05***
  - Step 2: Determine which multiplier to use, and whether it's + or -
    - The problem mentions an increase in ΔI_G.: use a (+) spending multiplier
  - Step 3: Calculate the Spending and / or Tax Multiplier
    - $^{1}/_{\text{MPS}}$ = $^{1}/_{.05}$ = ***20***
  - Step 4: Calculate the Change in AD
    - (Δ C, I_G, G, or X_N) * Spending Multiplier
    - ($100 billion ΔI_G) * (20) = ***$2000 billion ΔAD = AKA = $2 trillion ΔAD***

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MPS, MPC, & Multipliers

- Ex. Assume France raises taxes on its citizens by €500 billion . Furthermore, assume that the French save 25% of the change in their disposable income. Calculate the effect the €500 billion change in taxes on the French economy.
  - Step 1: Calculate the MPC and MPS
    - MPS = 25%(given in the problem) = **.25**
    - MPC = 1 – MPS = 1 - .25 = **.75**
  - Step 2: Determine which multiplier to use, and whether it's + or -
    - The problem mentions an increase in T .: use (-) tax multiplier
  - Step 3: Calculate the Spending and/or Tax Multiplier
    - $^{-MPC}/_{MPS} = {}^{-.75}/_{.25} =$ **-3**
  - Step 4: Calculate the Change in AD
    - (Δ Tax) * Tax Multiplier
    - (€500 billion Δ T) * (-3) = ***-€1500 billion Δ in AD = AKA = -€1.5 trillion Δ in AD***

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MPS, MPC, & Multipliers

- Ex. Assume the British spend $^4/_5$ of their disposable income. Furthermore, assume that the British government increases its spending by £50 billion and in order to maintain a balanced budget simultaneously increases taxes by £50 billion. Calculate the effect the £50 billion change in government spending and £50 billion change in taxes on British Aggregate Demand.
  - Step 1: Calculate the MPC and MPS
    - MPC = $^4/_5$ (given in the problem) = **.80**
    - MPS = 1 – MPC = 1 - .80 = **.20**
  - Step 2: Determine which multiplier to use, and whether it's + or -
    - The problem mentions an increase in G and an increase in T .: combine a (+) spending with a (–) tax multiplier
  - Step 3: Calculate the Spending and Tax Multipliers
    - Spending Multiplier = $^1/_{MPS} = {}^1/_{.20} =$ **5**
    - Tax Multiplier = $^{-MPC}/_{MPS} = {}^{-.80}/_{.20} =$ **-4**
  - Step 4: Calculate the Change in AD
    - [Δ G * Spending Multiplier] + [Δ T * Tax Multiplier]
    - [(£50 billion Δ G) * 5] + [(£50 billion Δ T) * -4]
    - [£250 billion] + [- £200 billion] = £50 billion Δ AD

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The Balanced Budget Multipler

- That last problem was a pain, huh?
- Remember when Government Spending increases are matched with an equal size increase in taxes, that the change ends up being = to the change in Government spending.
- Why?

$$^1/_{MPS} + {}^{-MPC}/_{MPS} = {}^{1-MPC}/_{MPS} = {}^{MPS}/_{MPS} = 1$$

- The balanced budget multiplier always = 1

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Summary

- An initial change in spending (C, I_G, G, X_N) causes a larger change in aggregate spending, or Aggregate Demand (AD).
- When the government taxes, the multiplier works in reverse because now money is leaving the circular flow.
- If Government Spending increases are matched with an equal size increase in taxes, that the change ends up being = to the change in Government spending.

$$\mathbf{^1/_{MPS} + {}^{-MPC}/_{MPS} = {}^{1-MPC}/_{MPS} = {}^{MPS}/_{MPS} = 1}$$

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