Disposable Income

- Net Income
- Paycheck
- After-tax income

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 = $\Delta C / \Delta DI$

Marginal Propensity to Save (MPS)

- The fraction of any change in disposable income that is saved.

- MPS= $\frac{\text{Change in Savings}}{\text{Change in Disposable Income}}$

- MPS = $\Delta S / \Delta DI$

Marginal Propensities

- MPC + MPS = 1
  - .: MPC = 1 – MPS
  - .: MPS = 1 – MPC
- Remember, people do two things with their disposable income, consume it or save it!

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 = $\Delta \text{ AD} / \Delta \text{ C, I, G, or Xn}$

The Spending Multiplier Effect

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

The Spending Multiplier Effect

- Ex. If the government increases defense spending by $1 Billion, then defense contractors will hire and pay more workers, which will increase aggregate spending by more than the original $1 Billion.

Calculating the Spending Multiplier

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

Calculating the Tax Multiplier

- When the government taxes, the multiplier works in reverse
- Why?
  - Because now money is leaving the circular flow
- Tax Multiplier (note: it's negative)
  - $= {}^{-MPC}/_{1-MPC}$ or $^{-MPC}/_{MPS}$
- If there is a tax-CUT, then the multiplier is +, because there is now more money in the circular flow

MPS, MPC, & Multipliers

- **Ex. Assume U.S. citizens spend 90¢ for every extra $1 they earn. Further assume that the real interest rate (r%) decreases, causing a $50 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 = $^{\Delta C}/_{\Delta DI}$ = $^{.9}/_{1}$ = *.9***
    - **MPS = 1 – MPC = *.10***
  - **Step 2: Determine which multiplier to use, and whether it's + or -**
    - **The problem mentions an increase in Δ I_G .: use a (+) spending multiplier**
  - **Step 3: Calculate the Spending and/or Tax Multiplier**
    - **$^{1}/_{MPS}$ = $^{1}/_{.10}$ = *10***
  - **Step 4: Calculate the Change in AD**
    - **(Δ C, I_G, G, or X_N) * Spending Multiplier**
    - **($50 billion Δ I_G) * (10) = *$500 billion ΔAD***

MPS, MPC, & Multipliers

- **Ex. Assume Germany raises taxes on its citizens by €200 billion . Furthermore, assume that Germans save 25% of the change in their disposable income. Calculate the effect the €200 billion change in taxes on the German 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**
    - **(€200 billion Δ T) * (-3) = *-€600 billion Δ in AD***

MPS, MPC, & Multipliers

- **Ex. Assume the Japanese spend $^4/_5$ of their disposable income. Furthermore, assume that the Japanese government increases its spending by ¥50 trillion and in order to maintain a balanced budget simultaneously increases taxes by ¥50 trillion. Calculate the effect the ¥50 trillion change in government spending and ¥50 trillion change in taxes on Japanese 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 trillion Δ G) * 5] + [(¥50 trillion Δ T) * -4]**
    - **[¥250 trillion] + [- ¥200 trillion] = *¥50 trillion Δ AD***

The Balanced Budget Multiplier

- That last problem was a pain, wasn't it?
- 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