Aggregate Expenditure Model
Aggregate Expenditure

- **AE** – Total spending in the economy on final goods and services.
  - Consists of consumption expenditures, *planned* investment expenditures, government expenditures, and foreign purchases.
    - $AE = C + I + G + Nx$
    - Actual investment = planned investment + changes in unplanned inventories.

- **AE Model** – a macroeconomic model that focuses on the short-run relation between total spending and real GDP, assuming constant prices.
Inventories

- Inventories - goods that have been produced but not yet sold.
- Actual investment = planned investment + changes in unplanned inventories
- Firms try to plan ahead and forecast sales, but they are not always correct.
  - If actual investment > planned investment, then ↑ inventories
  - If actual investment < planned investment, then ↓ inventories
  - If actual investment = planned investment, then no changes in unplanned inventories
Macroeconomic Equilibrium

- Total Spending = Total Output
  \[ AE = GDP \]

- What happens in the economy if \( AE > GDP \)?
  - Sales are strong and unplanned inventories decrease. Firms react by increasing production. As production increases, unemployment decreases, and GDP and income increase.

- What happens in the economy if \( AE < GDP \)?
  - Sales are weak and unplanned inventories increase. Firms react by decreasing production. As production falls, unemployment increases, and GDP and income decrease.
To Summarize

<table>
<thead>
<tr>
<th>If...</th>
<th>Then Inventories....</th>
<th>And...</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE = GDP</td>
<td>are unchanged</td>
<td>the economy is in equilibrium</td>
</tr>
<tr>
<td>AE &gt; GDP</td>
<td>decrease</td>
<td>GDP, employment, and income increase</td>
</tr>
<tr>
<td>AE &lt; GDP</td>
<td>increase</td>
<td>GDP, employment, and income decrease</td>
</tr>
</tbody>
</table>
Determinants of Consumption

- Current disposable income
  - Most important determinant
- Household wealth
- Expected future income
- Interest rate
- Price levels
Determinants of Investment

- Expectations about future profitability
- Interest rates
- Taxes/Subsidies
- Profits
Determinants of Government Spending

- Mandatory and discretionary spending by the government is left up to current laws and negotiations between Congress and the President.
Determinants of Net Exports

- Relative price levels of US to rest of world (row).
  - US has low inflation, $N_x$ increases.
- Relative growth rate of US to row.
  - If US incomes grow faster than aboard, $N_x$ decreases.
- Exchange rate between dollar and other currencies.
  - A weak dollar increases $N_x$. 
The consumption function is the relationship between consumption and disposable income.

\[ C = a + \text{MPC}(Y-T) \]

- \( a \) = autonomous consumption
- \( \text{MPC} \) = Marginal Propensity to Consume

What is the slope of the consumption function (and the AE line)?

\[ \text{MPC} = \frac{\Delta \text{Consumption}}{\Delta \text{Disposable income}} \]
Marginal Propensity to Consume

- **MPC** – the additional consumption caused by additional income.
- e.g. Between 2006 and 2007, consumption spending increased by $208B while disposable income increased by $228B, what is the MPC?
  - \( \frac{208}{228} = 0.91 \)
  - HHs spent $0.91 cents out of every additional increase in disposable income.
National Income, Consumption, and Savings

- \( Y = C + S + T \)
- \( \Delta Y = \Delta C + \Delta S + \Delta T \)
  - Assume \( \Delta T = 0 \). This is not true, but it simplifies our analysis and nothing important gets lost.
  - \( \frac{\Delta Y}{\Delta Y} = \frac{\Delta C}{\Delta Y} + \frac{\Delta S}{\Delta Y} \) or \( 1 = MPC + MPS \)

- e.g. If the MPC is 0.91 and incomes increased by a $100, then HHs spent $91 and saved $9.
The Multiplier

- Multiplier = $\frac{\Delta \text{Real GDP}}{\Delta \text{Autonomous Spending}}$

- The multiplier effect – the process by which an increase in autonomous expenditure leads to larger increases in GDP, and vice versa.

- Autonomous expenditure is spending independent on the level of GDP (I, G, Nx)
  - Consumption has an autonomous component and an induced component that depends on the level of GDP.
    - $C = a + \text{MPC}(Y-T)$; $a =$ autonomous component.
The Multipliers

- The autonomous spending or fiscal multiplier is
  \[ k_e = \frac{1}{1 - MPC} \text{ or } \frac{1}{MPS} \]

- The tax multiplier is \[ k_t = -[k_e - 1] \text{ or } \frac{-MPC}{MPS} \]

- The balance budget multiplier is \( k_b = 1 \)
Summarizing the Multiplier Effect

- Multipliers work in both directions.
- They show the intricacies of the macroeconomy.
- The larger the MPC, the larger the multiplier.
  - The multipliers are larger for lower income HHs.
- They are overstated in class/textbook since we are ignoring real world complexities.
The Multiplier: An Example

- The Government increases spending by $500. Assume a MPC = 0.80. Therefore, $k_e = 5$. What is the final effect?

<table>
<thead>
<tr>
<th>Round</th>
<th>Effect</th>
<th>Total Effect</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>$500</td>
<td>$500</td>
</tr>
<tr>
<td>2</td>
<td>400</td>
<td>900</td>
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<tr>
<td>3</td>
<td>320</td>
<td>1,220</td>
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<tr>
<td>4</td>
<td>256</td>
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<tr>
<td>5</td>
<td>204.8</td>
<td>1,680.8</td>
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<tr>
<td>n</td>
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</table>

- An initial increase in autonomous spending of $500, eventually increased GDP by $2,500.
The Multiplier: An Example

- The Government increases spending by $500. Assume a MPC = 0.90. Therefore, $k_e = 10$. What is the final effect?

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>$500</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>$n$</td>
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<td>5,000</td>
</tr>
</tbody>
</table>

- An initial increase in autonomous spending of $500, eventually increased GDP by $5,000.