Learning Objectives

- Explain how expenditure plans are determined when the price level is fixed.
- Explain how real GDP is determined when the price level is fixed.
- Explain the expenditure multiplier.
- Explain how imports and taxes influence the multiplier.
The Multiplier

- The multiplier is the amount by which a change in autonomous expenditure is magnified or multiplied to determine the change in equilibrium expenditure and real GDP.

\[
\frac{\Delta \text{GDP}}{\Delta \text{AE}}
\]
"The Multiplier"

- what happened?
  - $\overline{AD_0} \rightarrow \overline{AD_1}$; $\Delta \overline{AD} > 0$
  - $y_0^{eq} \rightarrow y_1^{eq}$; $\Delta y^{eq} > 0$
- the multiplier:
  \[
  \frac{\Delta y^{eq}}{\Delta \overline{AD}} = \frac{AB}{CD} = \frac{BD}{CD} > 1.0!
  \]

$\mathbf{y} = C + I \quad \Delta \mathbf{Y} = \Delta C + \overline{\Delta I} \quad 4 = 2 + 2$
\[ T = T + t \times Y \]

\( T \): tax revenue

\( \overline{T} \): autonomous tax revenue

\( \overline{T} \): property taxes

\( \overline{T} \): tax exemptions on income forms

- yourself
- your wife
- your children

\( t \): marginal tax rate

\( t \): from tax tables

**Model Options**

<table>
<thead>
<tr>
<th>Left Side</th>
<th>Right Side</th>
</tr>
</thead>
<tbody>
<tr>
<td>( T = \overline{T} )</td>
<td>( \overline{T} = 0 )</td>
</tr>
<tr>
<td>( t = 0 )</td>
<td>( t = z )</td>
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</tbody>
</table>
Multiplier Algebra

Basic Keynesian Model

<table>
<thead>
<tr>
<th>Model</th>
<th>no trade</th>
<th>with public sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Y = C + I + G )</td>
<td>( Y = C + I + G )</td>
<td></td>
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<tr>
<td>( C = a + b(Y - T) )</td>
<td>( C = a + b(Y - T) )</td>
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<tr>
<td>( G = G )</td>
<td>( G = G )</td>
<td></td>
</tr>
<tr>
<td>( I = I )</td>
<td>( I = I )</td>
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<tr>
<td>( T = T )</td>
<td>( T = T )</td>
<td></td>
</tr>
<tr>
<td>( \Delta Y = a + b(T - I) + I + G )</td>
<td>( \Delta Y = a + b(T - I) + I + G )</td>
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<tr>
<td>( \Delta Y = a + b(T - I) + I + G )</td>
<td>( \Delta Y = a + b(T - I) + I + G )</td>
<td></td>
</tr>
<tr>
<td>( \frac{\Delta Y}{\Delta I} = 1/(1 - b) )</td>
<td>( \frac{\Delta Y}{\Delta I} = \frac{1}{1 - (1 - t)b} )</td>
<td></td>
</tr>
</tbody>
</table>

Investment Multiplier

\( \Delta Y / \Delta I = \frac{1}{1 - b} \): name it!

\( \Delta Y / \Delta G = \frac{1}{1 - b} \): name it!

\( \Delta Y / \Delta T = -\frac{1}{1 - b} \): name it!