Sofar:

\[ \frac{\Delta RGDP}{\Delta q} = \frac{1}{1-b} > 0 \]

\[ \frac{\Delta P}{\Delta q} = 0 \]

Assumption throughout.

- Does fiscal policy have a price effect?

- Does output and prices vary pro-cyclical?

\[ \frac{\Delta P}{\Delta q} > 0 \]

\[ \frac{\Delta RGDP}{\Delta q} > 0 \]

If \( \Delta RGDP > 0 \) then \( \Delta P > 0 \)

If \( \Delta RGDP < 0 \) then \( \Delta P < 0 \)
Output and prices are very procyclically.

* Includes United States, Japan, Germany, United Kingdom, Canada, France and Italy.
let $\bar{q} > 0$

then $\Delta RGDP \geq 0$

by assumption $\Delta P \geq 0$

but in reality $\Delta P < 0$

challenge

find $\frac{\Delta P}{\Delta q}$

find price effect

last half of chapter 11
Fiscal Policy Multipliers and the Price Level

- Fiscal Policy and Aggregate Demand
  - We will use the aggregate demand-aggregate supply model to study the changes in real GDP and the price level that result from fiscal policy.

<table>
<thead>
<tr>
<th></th>
<th>$\Delta q$</th>
<th>$\Delta T$</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;real&quot; $\Delta GDP$</td>
<td>$\cdot$</td>
<td>$\cdot$</td>
</tr>
<tr>
<td>$\Delta P$</td>
<td>$\cdot$</td>
<td>$\cdot$</td>
</tr>
<tr>
<td>&quot;nominal&quot; $\Delta NGDP$</td>
<td>$\cdot$</td>
<td>$\cdot$</td>
</tr>
</tbody>
</table>

Derive these six "multipliers"
Government Purchases and Aggregate Demand

...that increases aggregate demand and shifts the $AD$ curve rightward

\[ \Delta Y = \frac{1}{1 - \beta} \Delta G \]

\[ \Delta Y = \frac{1}{1 - \beta} \Delta G \]

\[ \frac{\Delta GDP}{\Delta G} = 2.0 \]
Fiscal Policy, Real GDP, and the Price Level

SAS: Short run aggregate supply curve

- Price level
  - GDP deflator, 1992 = 100
  - 150
  - 130
  - 126
  - 110
  - 90

- Real GDP (trillions of 1992 dollars)
  - 7
  - 8
  - 8.6
  - 9

- $\frac{\Delta RGDP}{\Delta \bar{q}} = 1.6$
- $\frac{\Delta P}{\Delta \bar{q}} = 16$

Copyright © 1998 Addison Wesley Longman, Inc.
GDP deflator (1996 = 100)

Year


25 50 75 100 125

United States: 1968-1999

where will point C be next?
Questions:

- Does $\bar{G} > 0$ or $\bar{T} < 0$ shift $P \text{ut} \text{RGDP}$ to the right?

- Does $\bar{C} > 0$ or $\bar{T} < 0$ shift $P \text{ut} \text{RGDP}$ to the right?
Fiscal Policy, Real GDP, and the Price Level

LAS: long run aggregate supply curve

In Long Run
\[ \frac{\Delta P}{\Delta Q} = 0 \]
\[ \frac{\Delta GDP}{\Delta Q} = 0 \]

Real GDP (trillions of 1992 dollars)

Copyright © 1998 Addison Wesley Longman, Inc.
### Expenditure Induced Effects

<table>
<thead>
<tr>
<th>Short run effects</th>
<th>Long run effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \Delta G )</td>
<td>( \Delta G )</td>
</tr>
<tr>
<td>( \Delta Y )</td>
<td>( \Delta Y )</td>
</tr>
<tr>
<td>( \Delta P )</td>
<td>( \Delta P )</td>
</tr>
<tr>
<td>( \Delta NGDP )</td>
<td>( \Delta NGDP )</td>
</tr>
</tbody>
</table>

**Key Assumption:**
- LAS is fixed
- No Supply Side effects

**Key Notation:**
- \( \Delta G \) increases \( G \) by \( \Delta G \)
- \( \Delta Y \) increases \( Y \) by \( \Delta Y \)
- \( \Delta P \) increases \( P \) by \( \Delta P \)
- \( \Delta NGDP \) increases \( NGDP \) by \( \Delta NGDP \)

**Diagram:**
- Long run real neutrality

**Additional Observations:**
- \( \frac{\Delta G}{\Delta Y} > 0 \) in the short run