Problem Set 8: The Effects of Changes in the Government Spending and the Deficit
Open Economy, Savings Responds to the Interest Rate

Overview: In this problem set, you will investigate how changes in government spending, financed by changing the government’s surplus or deficit, affect an economy. In particular, you will investigate three scenarios differing by the amount of government spending (and borrowing) in an economy. This material is covered in chapters 13 and 15 as well as your class notes.

Assumptions: It is assumed that the economy is at full employment (\(Q_{\text{Act}} = Q_{\text{Nat}}\)). Further, imports (M) are assumed to be constant. Savings responds to the interest rate. Finally, government borrowing is assumed to have nothing to do with the interest rates. i.e., Your \(Q_{SGov}\) and \(Q_{DGov}\) columns should be the same number all the way down for a given situation.

Example: On page 2 you are given an example. The key to the example is on page 3. So, how do you get the answers? First, add the private U.S. market for loanable funds (leftmost table) and government’s demand or supply of loanable funds (2nd from left) to the get the U.S. market for loanable funds (middle table). Note, if the government is running a surplus, it is supplying loanable funds.

Next, add the U.S. market for loanable funds (middle table) and the market for loanable funds in the rest of the world (2nd table from right) to get the world market for loanable funds (right most table). We find that the loanable funds market will be in equilibrium at a real interest rate of 5.5%.

At the equilibrium interest rate, U.S. investment is $1,400. U.S. private savings is $1,500. Next calculate the amount and direction of international financial capital flows. $400 of financial capital inflows (from the U.S. to the R.O.W) is needed to balance the loanable funds market. Finally, calculate exports by “balancing” the flows between the U.S. and the R.O.W. Since U.S. imports are $900, and there are $400 of financial capital flows coming into the U.S., U.S. exports must be $500.

One can also derive the international financial capital flows from the tables. Look at the U.S. market for loanable funds (middle table). At the equilibrium interest rate of 5.5%, U.S. quantity supplied is $400 less than U.S. quantity demanded. The difference is made up by $400 of financial capital inflows from abroad (i.e. foreigners purchase $400 of U.S. bonds, CD’s, and other financial assets. Likewise, you can look at the R.O.W. market for loanable funds. At 5.5%, the R.O.W.’s quantity supplied from the rest of the world is $400 greater than quantity demanded. The extra supply of loanable funds, $400, means (the same) $400 of financial capital flows from the R.O.W. to the U.S. Check to make sure the loanable funds market balances and then calculate exports.

Your Turn: On pages 5 – 7, you are given 3 different situations. The situations only differ by the govt deficit. Answer the questions on page 4. Staple and turn in pages 4 – 7.
### Example

You are given the following:

- **Private U.S. Market, Rest of World Market**
  - Government Spending (excl. transfers) = $1,250
  - Taxes (net of transfers) = $750
  - Imports = $900 (this does not change)

You derive the following:

- **Govt. Deficit or Surplus** = 
- **Investment** = 
- **Savings** = 
- **Exports** = 
- **Net Financial Capital Flows** = 
- **Trade Deficit or Surplus** = 

### Table: Loanable Funds Market

<table>
<thead>
<tr>
<th>r</th>
<th>QS</th>
<th>QD</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5%</td>
<td>$1,900</td>
<td>$1,000</td>
</tr>
<tr>
<td>7.0%</td>
<td>$1,800</td>
<td>$1,100</td>
</tr>
<tr>
<td>6.5%</td>
<td>$1,700</td>
<td>$1,200</td>
</tr>
<tr>
<td>6.0%</td>
<td>$1,600</td>
<td>$1,300</td>
</tr>
<tr>
<td>5.5%</td>
<td>$1,500</td>
<td>$1,400</td>
</tr>
<tr>
<td>5.0%</td>
<td>$1,400</td>
<td>$1,500</td>
</tr>
<tr>
<td>4.5%</td>
<td>$1,300</td>
<td>$1,600</td>
</tr>
<tr>
<td>4.0%</td>
<td>$1,200</td>
<td>$1,700</td>
</tr>
</tbody>
</table>

### Table: U.S. Govt Borrow/Lend

<table>
<thead>
<tr>
<th>r</th>
<th>QS_{gov}</th>
<th>QD_{gov}</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5%</td>
<td>$2,400</td>
<td>$800</td>
</tr>
<tr>
<td>7.0%</td>
<td>$2,200</td>
<td>$900</td>
</tr>
<tr>
<td>6.5%</td>
<td>$2,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>6.0%</td>
<td>$1,800</td>
<td>$1,100</td>
</tr>
<tr>
<td>5.5%</td>
<td>$1,600</td>
<td>$1,200</td>
</tr>
<tr>
<td>5.0%</td>
<td>$1,400</td>
<td>$1,300</td>
</tr>
<tr>
<td>4.5%</td>
<td>$1,200</td>
<td>$1,400</td>
</tr>
<tr>
<td>4.0%</td>
<td>$1,000</td>
<td>$1,500</td>
</tr>
</tbody>
</table>

### Table: U.S. Private + Govt.

<table>
<thead>
<tr>
<th>r</th>
<th>QS_{usa}</th>
<th>QD_{usa}</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5%</td>
<td>$1,250</td>
<td>$750</td>
</tr>
<tr>
<td>7.0%</td>
<td>$1,100</td>
<td>$500</td>
</tr>
<tr>
<td>6.5%</td>
<td>$1,200</td>
<td>$500</td>
</tr>
<tr>
<td>6.0%</td>
<td>$1,300</td>
<td>$500</td>
</tr>
<tr>
<td>5.5%</td>
<td>$1,400</td>
<td>$500</td>
</tr>
<tr>
<td>5.0%</td>
<td>$1,500</td>
<td>$500</td>
</tr>
<tr>
<td>4.5%</td>
<td>$1,600</td>
<td>$500</td>
</tr>
<tr>
<td>4.0%</td>
<td>$1,700</td>
<td>$500</td>
</tr>
<tr>
<td>Loanable Funds Mkt</td>
<td>Private U.S. Market</td>
<td>U.S. Govt Borrow/Lend</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>( r )</td>
<td>( QS_{\text{USA}} )</td>
<td>( QD_{\text{USA}} )</td>
</tr>
<tr>
<td>7.5%</td>
<td>$1,900</td>
<td>$1,500</td>
</tr>
<tr>
<td>7.0%</td>
<td>$1,800</td>
<td>$1,600</td>
</tr>
<tr>
<td>6.5%</td>
<td>$1,700</td>
<td>$1,700</td>
</tr>
<tr>
<td>6.0%</td>
<td>$1,600</td>
<td>$1,800</td>
</tr>
<tr>
<td>5.5%</td>
<td>$1,500</td>
<td>$2,000</td>
</tr>
<tr>
<td>5.0%</td>
<td>$1,400</td>
<td>$2,100</td>
</tr>
<tr>
<td>4.5%</td>
<td>$1,300</td>
<td>$2,200</td>
</tr>
<tr>
<td>4.0%</td>
<td>$1,200</td>
<td>$2,200</td>
</tr>
</tbody>
</table>

Example - Key

You are given the following:

- Private U.S. Market, Rest of World Market
- Govt Spending (excl. transfers) = $1,250
- Taxes (net of transfers) = $750
- Imports = $900

You derive the following:

- Govt. Deficit or Surplus = $500
- \( r_E = 5.5\% \)
- Investment = $1,400
- Savings = $1,500
- Exports = $500
- Net Fin. Capital Flows = $400 from ROW to US
- Trade Deficit or Surplus = $400
### Part 1: Situation 1
1. _____ How does the government deficit in this situation compare to that of the other situations?
   a. most borrowing (least lending) by government.
   b. middle level of borrowing (lending) by government.
   c. least borrowing (most lending) by government.

2. What is the equilibrium real interest rate? ________%  
3. What is the $ value of U.S. Investment? $ ________  
4. What is the $ value of international capital flows? $ ________  
5. _____ Which direction are these flows going?  
   a. from the U.S. to ROW  
   b. from the ROW to U.S.  
   c. no net capital flows  
6. What is the value of U.S. exports? $ ________

### Part 2: Situation 2
7. _____ How does the government deficit in this situation compare to that of the other situations?
   a. most borrowing (least lending) by government.
   b. middle level of borrowing (lending) by government.
   c. least borrowing (most lending) by government.

8. What is the equilibrium real interest rate? ________%  
9. What is the $ value of U.S. Investment? $ ________  
10. What is the $ value of international capital flows? $ ________  
11. _____ Which direction are these flows going?  
    a. from the U.S. to ROW  
    b. from the ROW to U.S.  
    c. no net capital flows  
12. What is the value of U.S. exports? $ ________

### Part 3: Situation 3
13. _____ How does the government deficit in this situation compare to that of the other situations?
    a. most borrowing (least lending) by government.
    b. middle level of borrowing (lending) by government.
    c. least borrowing (most lending) by government.

14. What is the equilibrium real interest rate? ________%  
15. What is the $ value of U.S. Investment? $ ________  
16. What is the $ value of international capital flows? $ ________  
17. _____ Which direction are these flows going?  
    a. from the U.S. to ROW  
    b. from the ROW to U.S.  
    c. no net capital flows  
18. What is the value of U.S. exports? $ ________

### Part 4: General Questions
19. _____ In this problem set, we assumed that the economy is at Q Nat. i.e. We assumed that changes in government spending do not change the size of production, only the composition of production. What time period are we assuming?  
   a. the short-run  
   b. the long-run  
   c. the doo run-run-run

20. In the long-run, how does an increase in the government deficit tend to affect the economy? Use Increase, No Change, or Decrease in the blanks.  
    real interest rates ________  
    Investment ________  
    Net Exports (or just exports) ________
### Situation 1

**You are given the following** (none of which changes)

- Private U.S. Market, Rest of World Market
- Govt Spending (excl. transfers) = $3,800
- Taxes (net of transfers) = $3,200
- Imports = $2,000

**You derive the following**

- Govt. Deficit or Surplus =
- \( r_E = \)
- Investment =
- Savings =
- Net Capital Flows =
- Exports =
- Trade Deficit or Surplus =
### Situation 2

You are given the following (none of which changes)

- Private U.S. Market, Rest of World Market
- Govt Spending (excl. transfers) = $2,000
- Taxes (net of transfers) = $3,200
- Imports = $2,000

You derive the following

```
Govt. Deficit or Surplus = 
\( r_E = \)
Investment = 
Savings = 
Net Capital Flows = 
Exports = 
Trade Deficit or Surplus = 
```
### Situation 3

You are given the following (none of which changes)

- **Private U.S. Market, Rest of World Market**
- **Govt Spending (excl. transfers) = $3,200**
- **Taxes (net of transfers) = $3,200**
- **Imports = $2,000**

You derive the following

- **Govt. Deficit or Surplus =**
- \( r_E = \)
- **Investment =**
- **Savings =**
- **Net Capital Flows =**
- **Exports =**
- **Trade Deficit or Surplus =**