Problem Set 11: The Effects of Changes in the Savings Rate
Open Economy, Savings Responds to the Interest Rate

Overview: In this problem set, you will investigate how changes in the private savings rate affects an economy. In particular, you will investigate five scenarios differing by the private savings rate (at any given real interest rate). You will determine the equilibrium conditions for an economy at full employment. This material is covered in your chapters 9 (especially pp 231 – 239) and 12 (especially pp 299 – 301) text and notes.

Assumptions: It is assumed that the economy is at full employment. 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 $Q_{S, Gov}$ and $Q_{D, Gov}$ columns should be the same number all the way down for a given situation.

Example: On page two you are given a completed example showing the equilibrium conditions an economy. U.S. supply and demand for loanable funds is composed of private U.S. demand for loanable funds (i.e. Investment), the private U.S. supply of loanable funds (i.e. borrowing by households), and government borrowing (a demand for loanable funds). Note, if the government is running a surplus, it is supplying loanable funds. To this we need to add foreign (i.e. rest of world) supply and demand. Putting it all together. We find that the loanable funds market will be in equilibrium at a real interest rate of 5.5%. At that interest rate, U.S. quantity supplied is $400 less than U.S. quantity demanded. The difference is made up by $400 of capital inflows from abroad. Likewise, quantity supplied from the rest of the world is $400 greater than quantity demanded. This means (the same) $400 of capital inflows from abroad.

U.S. investment has to be $1,400. Since U.S. imports are $900, and there are $400 of capital flows coming into the U.S., one can deduce that U.S. exports are $500.

Your Turn: Now comes the fun part. On pages 3 – 5, you are given 3 different situations. The situations only differ by the savings rate (at any given real interest rate). Fill in the numbers, similar to the example, and answer the questions on page 6. Turn in page 6.

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1 In actuality, imports would respond to changes in 1) the foreign exchange rate caused by government borrowing. This will not, however, overturn the results found in this problem set. In fact, it would strengthen the results. Ex. ↑ U.S. Govt. Borrowing ⇒ ↑ value of the U.S. $ ⇒ ↑ M, i.e. a widening trade deficit. Imports would also change in response to savings (which is a function of the interest rate). The more households save, the less they spend on both consumption of domestic goods and on foreign imports. This would mean that government borrowing has less of an effect on the trade deficit.
Example

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 (this does not change)

You derive the following
Govt. Deficit or Surplus = $500
\( r_E = 5.5\% \)
Investment = $1,400
Savings = $1,500
Exports = $500
Net Capital Flows = $400 from ROW to US
Trade Deficit or Surplus = $400
### Situation 1

You are given the following (none of which changes)

- **Private U.S. Market, Rest of World Market**
- **Govt Spending (excl. transfers) = $4,300**
- **Taxes (net of transfers) = $4,000**
- **Imports = $2,000** (This does not change)

You derive the following

**Govt. Deficit or Surplus =**

\[ r_E = \]

**Investment =**

**Savings =**

**Net Capital Flows =**

**Exports =**

**Trade Deficit or Surplus = $100 deficit**
### Situation 2

You are given the following (none of which changes)

- Private U.S. Market, Rest of World Market
- Govt Spending (excl. transfers) = $4,300
- Taxes (net of transfers) = $4,000
- Imports = $2,000 (This does not change)

You derive the following

**Govt. Deficit or Surplus =**

\[ r_E = \]

**Investment =**

**Savings =**

**Net Capital Flows =**

**Exports =**

**Trade Deficit or Surplus =**

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<thead>
<tr>
<th>Private U.S. Market</th>
<th>Loanable Funds Mkt.</th>
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</thead>
<tbody>
<tr>
<td>( r )</td>
<td>( QS_{Priv} = S )</td>
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<tr>
<td>7.5%</td>
<td>$1,200</td>
</tr>
<tr>
<td>7.0%</td>
<td>$1,100</td>
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<tr>
<td>6.5%</td>
<td>$1,000</td>
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<tr>
<td>6.0%</td>
<td>$900</td>
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<td>5.5%</td>
<td>$800</td>
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<td>$700</td>
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<tr>
<td>4.5%</td>
<td>$600</td>
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<tr>
<td>4.0%</td>
<td>$500</td>
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### U.S. Govt. Borrow/Lend

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<tr>
<th>( r )</th>
<th>( QS_{Gov} )</th>
<th>( QD_{Gov} )</th>
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<tbody>
<tr>
<td>7.5%</td>
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### U.S. Private + Govt.

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<tr>
<th>( r )</th>
<th>( QS_{USA} )</th>
<th>( QD_{USA} )</th>
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<tbody>
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<td>7.5%</td>
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</table>

### Rest of World

<table>
<thead>
<tr>
<th>( r )</th>
<th>( QS_{ROW} )</th>
<th>( QD_{ROW} )</th>
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<td>7.5%</td>
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Situation 3

You are given the following (none of which changes)

- Private U.S. Market, Rest of World Market
- Govt Spending (excl. transfers) = $4,300
- Taxes (net of transfers) = $4,000
- Imports = $2,000

You derive the following

Govt. Deficit or Surplus =

\[ r_E = \]

Investment =

Savings =

Net Capital Flows =

Exports =

Trade Deficit or Surplus =
# Here’s My Problem Set # 11

**Name:** ____________________  
**Neatness Counts!**

## Part 1: Situation 1

1. _____ How does the savings rate compare to the other 2 situations?:  
   a. lowest savings rate  
   b. middle savings rate  
   c. highest savings rate

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.

6. What is the value of U.S. exports?  
   $ ________

## Part 2: Situation 2

7. _____ How does the savings rate compare to the other 2 situations?:  
   a. lowest savings rate  
   b. middle savings rate  
   c. highest savings rate

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.

12. What is the value of U.S. exports?  
    $ ________

## Part 3: Situation 3

13. _____ How does the savings rate compare to the other 2 situations?:  
    a. lowest savings rate  
    b. middle savings rate  
    c. highest savings rate

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.

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 QF. i.e. Only the composition of the economy is changed, not its size. What time period are we assuming?  
   a. the short-run  
   b. the long-run  
   c. the doo run-run

20. How does an increased savings rate effect this economy? i.e. What changes as a result of an increase in the savings rate?  
    ___________________________________________________________________

21. Is higher savings good or bad for an economy?  
    Why?  
    ___________________________________________________________________  
    ___________________________________________________________________  
    ___________________________________________________________________