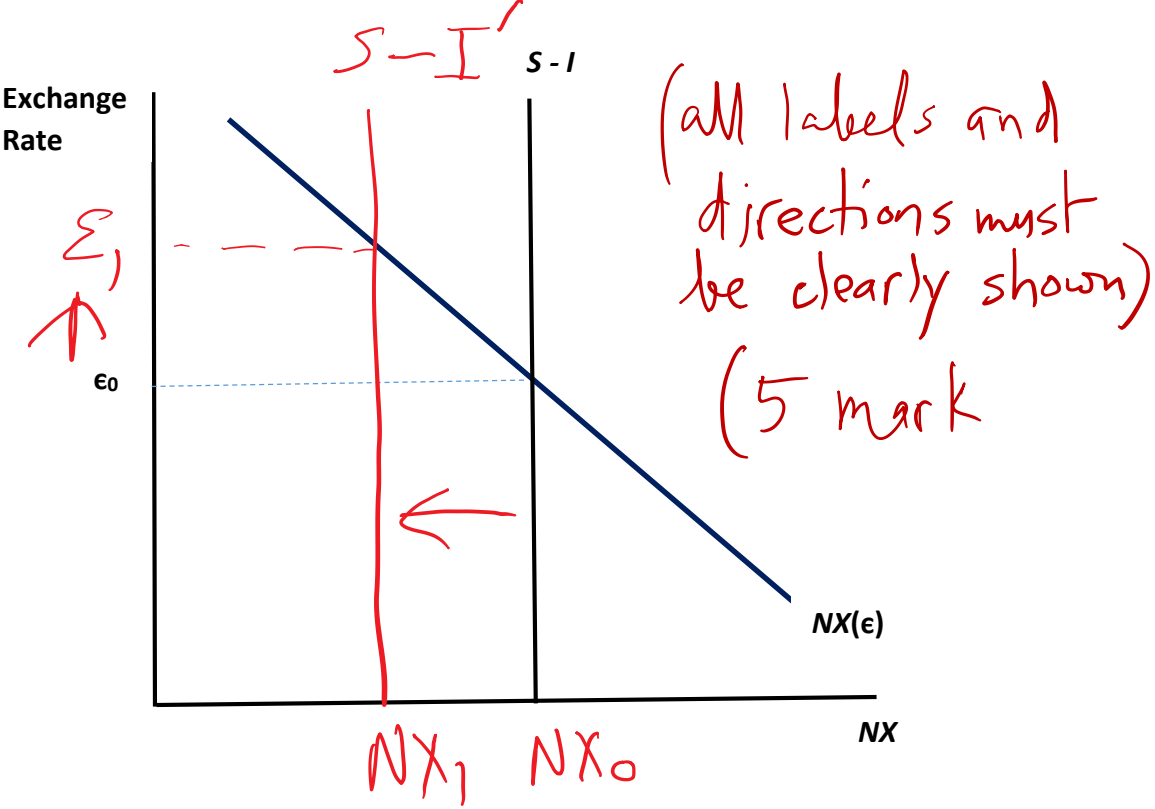


Mid-Term Analytical Questions' Answers

1. A rise in investment demand will shift the net capital outflow ($S - I$) line to the left. The real exchange rate will increase and net exports and net capital outflow will both decrease.



(1) Net exports and net capital outflow both fall. (2 marks)

(2) The real exchange rate increases. (1 mark)

2. (a) $Y = (10)(100)^{0.5}(400)^{0.5}$
 $= (10)(10)(20)$ (2 marks)
 $= 2000$

(b) $w = MPL = (0.5)(10)(L)^{-0.5}(K)^{0.5}$
 $= (0.5)(10) \frac{(100)^{0.5}}{(400)^{0.5}}$ (3 marks)
 $= 2.5$

(c) $r = MPK = (0.5)(10)(L)^{0.5}/K^{0.5}$
 $= (0.5)(10) \frac{(400)^{0.5}}{(100)^{0.5}}$
 $= (5)(2) = 10$ (3 marks)

3. The key point to note is that the only variable to be determined is the real interest rate r . All other variables can be easily determined using the information provided. Let us, however, first determine r , the equilibrium real interest rate.

- a. The equilibrium in this model implies equilibrium in the goods market (or, equivalently, in the loanable funds market). Note that, in this long-run model factor inputs are assumed fixed. With fixed inputs, output or GDP is also fixed, which is given $Y = 5,000$.

Taxes T and Government Spending G are also given:

$$G = 1,500$$

$$T = 1,000$$

Goods market equilibrium requires that total output produced in the economy, Y , is exactly equal to the aggregate demand (that is the aggregation of consumption, investment and government spending):

$$Y = C + I + G \quad (1)$$

(An alternative way of looking at the goods market equilibrium is to restate (1) in terms of the loanable funds market equilibrium. To see this, move C and G on the left hand side:

$$Y - C - G = I$$

The above can be rewritten as:

$$[(Y - T) - C] + (T - G) = I \quad (2)$$

$$(YD - C) + (T - G) = I$$

where YD is disposable income. The first term on the left hand side is Private Saving, S_p , and the second term is Public Saving, S_G . Private and public saving together is the national saving, S . Thus, the goods market equilibrium is alternatively stated as equilibrium in the loanable funds market: the equilibrium in the economy is obtained

when total saving generated in the economy is exactly equal to the total demand for investment:

$$S = I \quad (3)$$

We now substitute the given equations and values in the goods market equilibrium equation (1):

$$5,000 = 1,200 + 0.3(5,000 - 1,000) - 50r + 1,500 - 50r + 1,500.$$

$$\text{or, } 5,000 - 1,200 - 1,200 + 50r + 50r - 1,500 - 1,500 = 0$$

$$\text{or, } 50r - 400 = 0$$

$$\text{or, } 50r = 400, \text{ which solves for } r = 4.$$

(3 marks)

It seems that when $r = 4$, the goods market is in equilibrium in the sense that the total output demanded is exactly equal to the total output produced ($Y = 5,000$).

It is now straightforward to substitute $r = 4$ along with the given values for Y and T into the consumption and investment equations, and find equilibrium values of C and I .

$$C = 1,200 + 0.3(5,000 - 1,000) - 50 \cdot 4 = 2,200.$$

$$I = 1,500 - 50 \cdot 4 = 1,300.$$

(1 mark) (1 mark)

(Lin, please note: I have provided more details in the answer than is needed for full marks. The details are provided to help students understanding of the approach -- I intend to post this document on culearn. Also, the text highlighted in yellow above is just an alternative way of solving the model).

- b. Private saving is obtained by subtracting consumption from disposable income. The disposable income is income net of taxes: $YD = Y - T = 5,000 - 1,000 = 4,000$. We have already determined that $C = 2,200$. Thus private saving is:

$$S_p = YD - C = 4,000 - 2,200 = 1,800.$$

(1 mark)

$$\text{Public Saving, } S_G = T - G = 1,000 - 1,500 = -500.$$

(1 mark)

It seems that government saving is negative. In other words, the government runs a deficit budget.

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The national saving, $S = S_p + S_G = 1,800 - 500 = 1,300$. (1 mark)

- c. A rise in investment demand following technological innovation implies that nation's businesses now increase their investment at each given rate of interest. In the diagram we drew in class this would be shown as a rightward shift in the investment demand curve. Let us do this part of the problem using the loanable funds market equilibrium condition (2).

$$S = 2,000 - 50r.$$

Substituting the given values in equation (2) above, we have:

$$\text{or, } (5,000 - 1,000) - (1,200 + 0.3(5,000 - 1,000) - 50r) + (1,000 - 1,500) = 2,000 - 50r$$

$$\text{or, } 4,000 - 2,400 + 50r - 500 = 2,000 - 50r$$

$$\text{or, } 100r = 2,000 + 2,400 + 500 - 4,000$$

$$\text{or, } 100r = 900$$

solving $r = 9$ percent. (2 marks)

$$I = 2,000 - 50 * 9 = 1,550. \quad (1 \text{ mark})$$

$$C = 1,200 + 0.3(5,000 - 1,000) - 50 * 9 = 1,950. \quad (1 \text{ mark})$$

You should now see that with unchanged output, the increased demand must be met by a decrease in consumption, which is negatively affected by the rate of interest. Thus (compared with part a), increased demand for investment by 250 is met by decreased consumption by 250.

Note: the above text highlighted in yellow is also for illustration and understanding.

4. (a) The equilibrium interest rate is obtained by equating national saving to investment demand;

$$300 = 400 - 20r$$

giving $r = 5$ (4 marks)

- (b) If the economy is open, the investment at the world interest rate 10 would be $I = 400 - 20(10) = 200$.

Thus, trade balance = net capital outflow
 $= (S - I) = 100$
4 marks

- (c) With G rising by 100, national saving would fall to $(300 - 100) = 200$, which also equals investment. Consequently, $NX = (S - I) = 0$. (4 marks)