

ECON 3010 Intermediate Macroeconomic Theory
Solutions to Homework #5

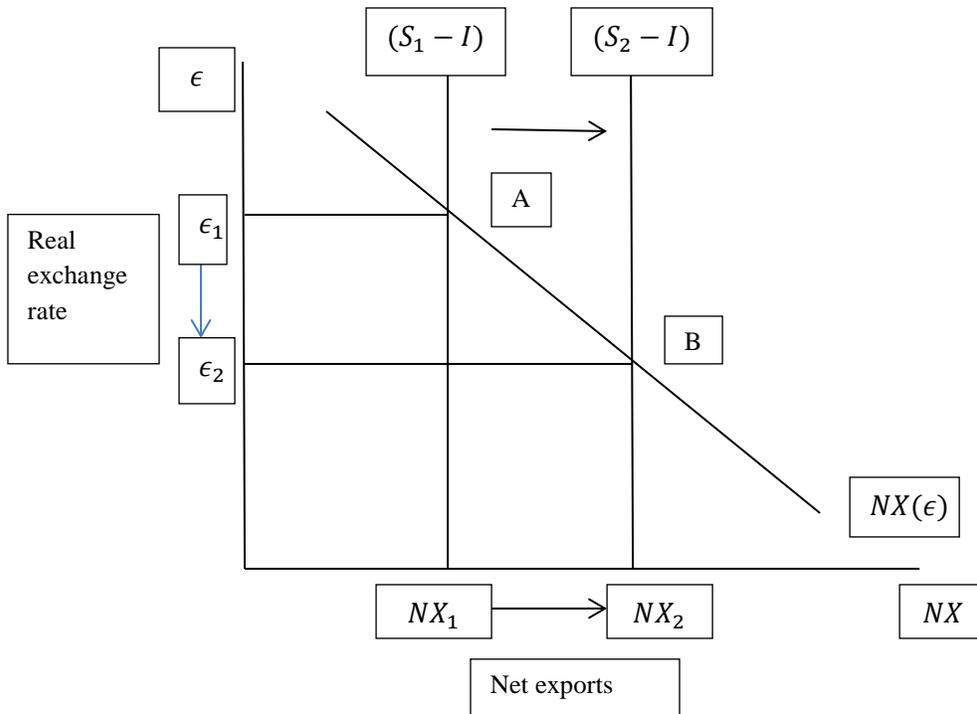
Ten *Sapling* multiple-choice questions. You have unlimited attempts to complete the assignment and they are due at midnight on the date above.

The written questions below should be typed.

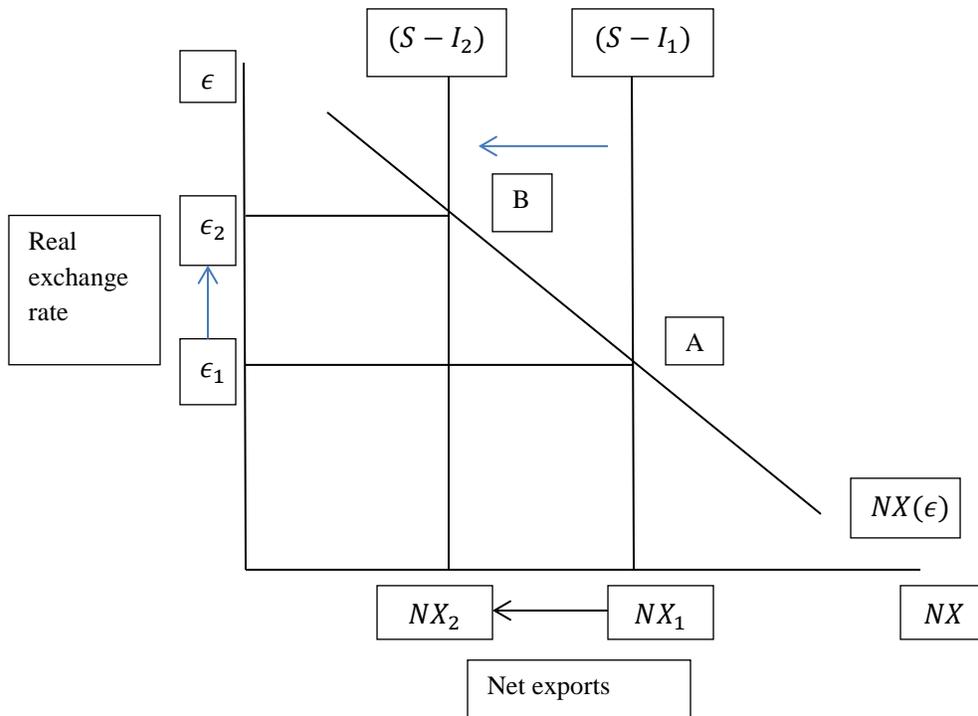
1. Chapter 6. Problems and Applications #1.

Solution.

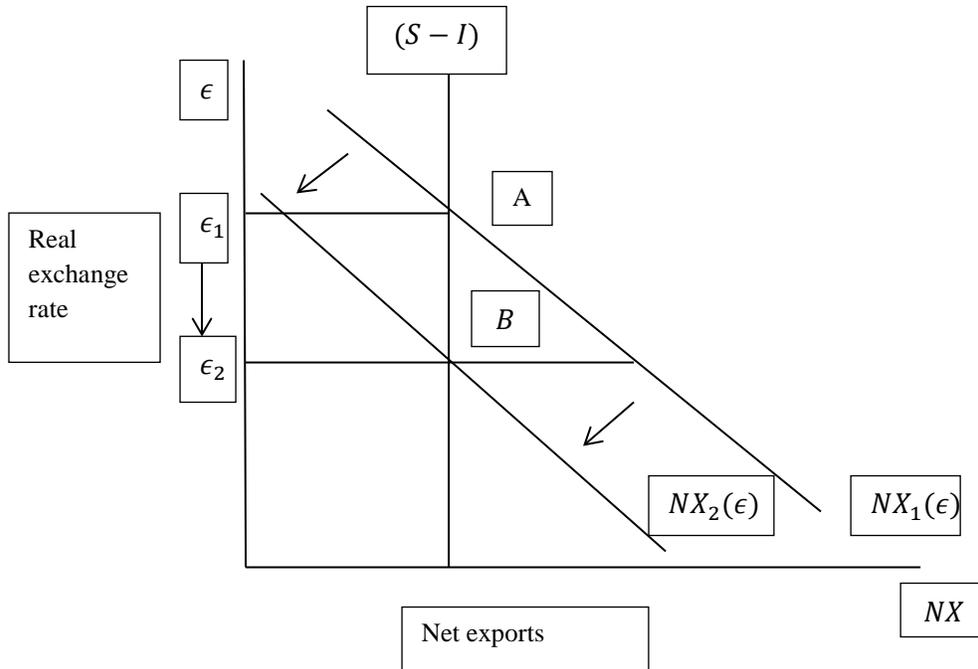
- a) An increase in saving shifts the $(S - I)$ schedule to the right, increasing the supply of dollars available to be invested abroad, as in the figure below. The increased supply of dollars causes the equilibrium real exchange rate to fall from ϵ_1 to ϵ_2 . Because the dollar becomes less valuable, domestic goods become less expensive relative to foreign goods, so exports rise and imports fall. This means that the trade balance increases. The nominal exchange rate falls following the movement of the real exchange rate, because prices do not change in response to this shock.



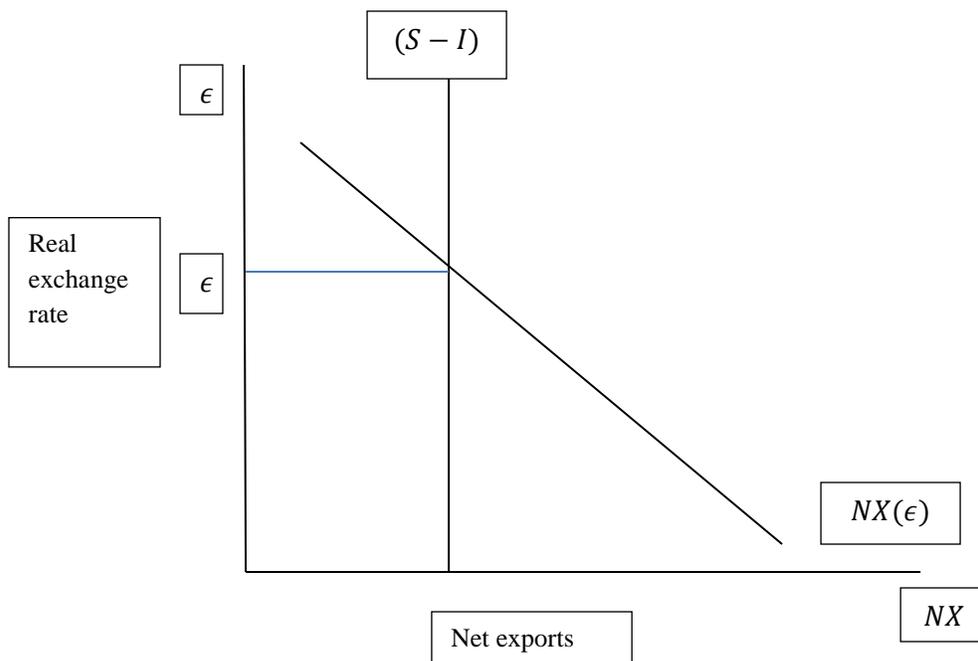
- b) The increase in investment will shift the $(S - I)$ schedule to the left, from $(S - I_1)$ to $(S - I_2)$, as in the figure below. Since there are now fewer dollars available to invest abroad, the real exchange rate will increase. The increase in the exchange rate value of the dollar will cause net exports to fall as imports rise and exports fall. The nominal exchange rate will increase along with the real exchange rate because there has been no change in the price level.



- c) The introduction of a stylish line of Toyotas that makes some consumers prefer foreign cars over domestic cars has no effect on savings or investment, but it shifts the $NX(\epsilon)$ schedule inward, as in the figure below. The trade balance does not change, but the real exchange rate falls from ϵ_1 to ϵ_2 . Because prices are not affected, the nominal exchange rate follows the real exchange rate.



- d) In the model we considered in this chapter, the doubling of the money supply has no effect on any real variables. The amount of capital and labor determine output \bar{Y} . The world interest rate r^* determines investment $I(r^*)$. The difference between domestic saving and domestic investment ($S - I$) determines net exports. Finally, the intersection of the $NX(\epsilon)$ schedule and the $(S - I)$ schedule determines the real exchange rate, as in the figure below.



The doubling of the money supply does affect the nominal exchange rate through its effect on the domestic price level. Using the quantity equation, a doubling of the money supply will cause the price level to double.

Now recall the formula for the nominal exchange rate: $e = \epsilon * \left(\frac{P^*}{P}\right)$.

We know that the real exchange rate ϵ remains constant, and we assume that the foreign price level P^* is fixed. When the domestic price level P increases, the nominal exchange rate e depreciates.

- e) The increase in the demand for money has no effect on any real variables, as was explained in part (d) above. Assuming that the nominal money supply M is fixed, an increase in the demand for money will reduce the price level. The reduction in the price level will cause the nominal exchange rate to appreciate.

2. Chapter 6. Problems and Applications #2.

Solution.

a) To start, we have the following

$$S_{pr} = Y - T - C = 8000 - 2000 - \left(500 + \left(\frac{2}{3}\right)(8000 - 2000)\right) = 1500$$

$$S_{pu} = T - G = 2000 - 2500 = -500$$

$$S = S_{pr} + S_{pu} = 1500 - 500 = 1000$$

$$I = 900 - 50(8) = 500$$

$$NX = S - I = 1000 - 500 = 500$$

Since the NX function is $NX = 1500 - 250\epsilon$, the equilibrium exchange rate is $\epsilon_* = 4$.

b) The new equilibrium with $G = 2000$ is

$$S_{pr} = Y - T - C = 8000 - 2000 - \left(500 + \left(\frac{2}{3}\right)(8000 - 2000)\right) = 1500$$

$$S_{pu} = T - G = 2000 - 2000 = 0$$

$$S = S_{pr} + S_{pu} = 1500 + 0 = 1500$$

$$I = 900 - 50(8) = 500$$

$$NX = S - I = 1500 - 500 = 1000$$

Since the NX function is $NX = 1500 - 250\epsilon$, the equilibrium exchange rate is now $\epsilon_* = 2$. Therefore the cut in government spending increases saving, improves the trade balance and causes a fall in the real exchange rate.

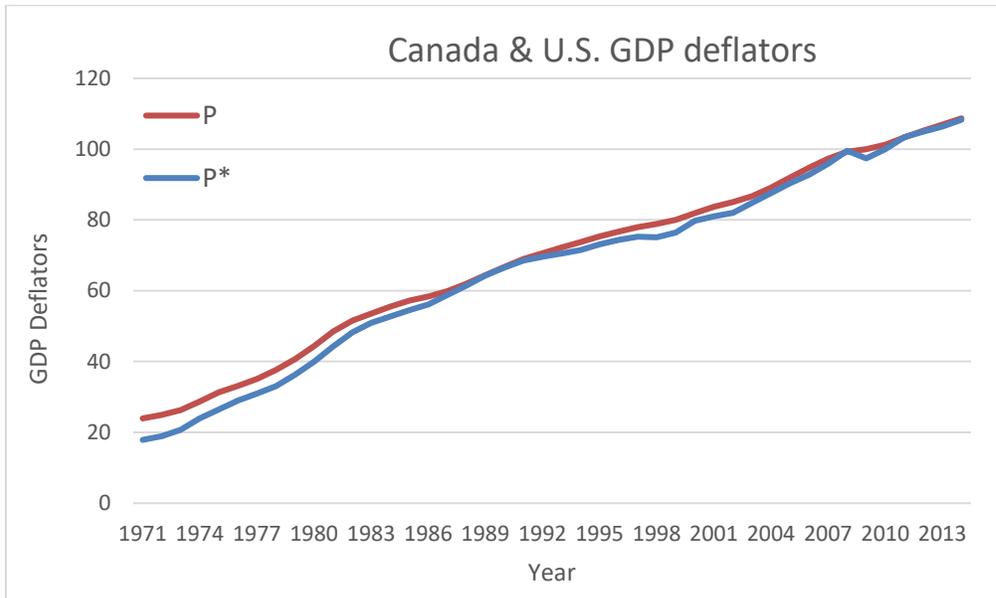
c) The new investment level is $I = 900 - 50(3) = 750$, which leads to $NX = S - I = 1000 - 750 = 250$. The new equilibrium exchange rate is $\epsilon_* = 5$, so the lower world interest rate lowers the trade balance and increases the real exchange rate.

3. The (annual) exchange rates between Canada and the U.S., as well as the respective GDP deflators are shown in the graphs below. For the real exchange rate, I use the formula

$$\epsilon = e \times \left(\frac{P}{P^*}\right),$$

where it is important to make sure both price indices (GDP deflators, in this case) are measured in the same base year. Here the base year is 2010.

Canada (P*) and U.S. (P) GDP Deflators



Canada/U.S. Nominal (e) and Real (ε) Exchange Rates

