

Some Answers

1) Consider an economy described by the following equations:

$$Y = C + I + G$$

$$Y = 5000$$

$$G = 1000$$

$$T = 1000$$

$$C = 250 + 0.75(Y - T)$$

$$I = 1000 - 50r$$

$$NX = 500 - 500\varepsilon$$

$$r = r^* = 5$$

a. In this economy, solve for national saving, investment, the trade balance, and the equilibrium exchange rate.

$$S = I = 750. \quad NX = 0. \quad \varepsilon = 1$$

b. Suppose now that G rises to 1250. Solve for national saving, investment, the trade balance, and the equilibrium exchange rate.

$$S = 500. \quad I = 750. \quad NX = -250. \quad \varepsilon = 1.5$$

c. Now suppose the world interest rate rises from 5 to 10 percent (G is again 1000). Solve for national saving, investment, the trade balance, and the equilibrium exchange rate.

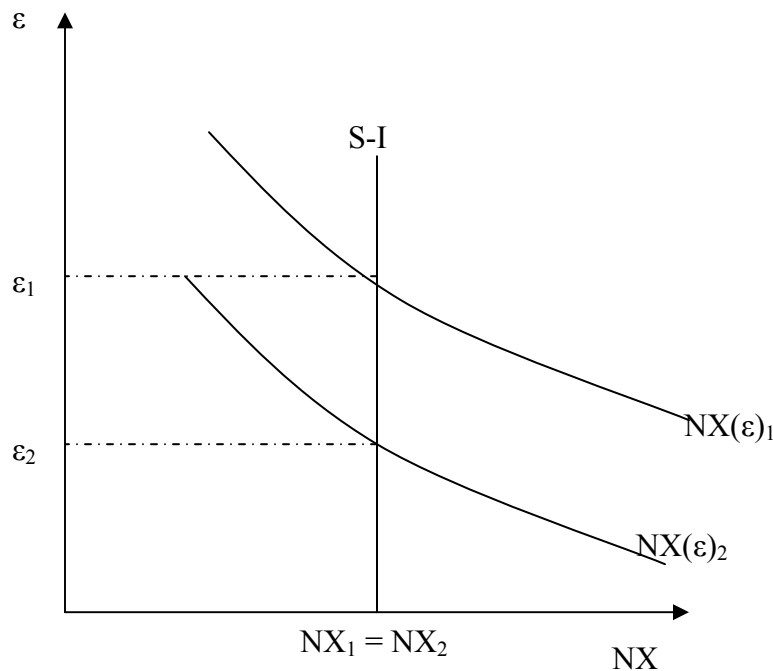
$$S = 750. \quad I = 500. \quad NX = 250. \quad \varepsilon = 0.5$$

2) The country of Leverett is a small open economy. Suddenly, a change in world fashions makes the exports of Leverett unpopular.

a. What happens in Leverett to saving, investment, net exports, the interest rate, and the exchange rate?

When Leverett's exports become less popular, its domestic saving $Y - C - G$ does not change. This is because we assume that Y is determined by the amount of capital and labor, consumption depends only on disposable income, and government spending is a fixed exogenous variable. Investment also does not change, since investment depends on the interest rate, and Leverett is a small open economy that takes the world interest rate as given. Because neither saving nor investment changes, net exports, which equal $S - I$, do not change either. This is shown below as the unmovable $S - I$ curve.

The decreased popularity of Leverett's exports lead to a shift inward of the net exports curve. At the new equilibrium, net exports are unchanged but the real exchange rate has depreciated. Even though Leverett's exports are less popular, its trade balance has remained the same. The reason for this is that the depreciated currency provides a stimulus to net exports, which overcomes the unpopularity of its exports by making them cheaper.



- b. The citizens of Leverett like to travel abroad. How will this change in the exchange rate affect them?

Leverett's currency now buys less foreign currency, so traveling abroad is more expensive. This is an example of the fact that imports (including foreign travel) have

become more expensive – as required to keep net exports unchanged in the face of decreased demand for exports.

- 3) Suppose that some foreign countries begin to subsidize investment by instituting an investment tax credit.

- a) What happens to world investment demand as a function of the world interest rate?

Rises.

- b) What happens to the world interest rate?

Rises.

- c) What happens to investment in our small open economy?

Falls.

- d) What happens to our trade balance?

Rises.

- e) What happens to our real exchange rate?

Falls.

- 4) In his State of the Union address, President Bush proposed increasing government spending for the war on terrorism and additional decreases in taxes.

- a. Explain what the long-run impact of this program would be on real GDP, public saving, private saving, and national saving.

Because real GDP in the long run is a function solely of technology and factor inputs, it will be unaffected by the change.

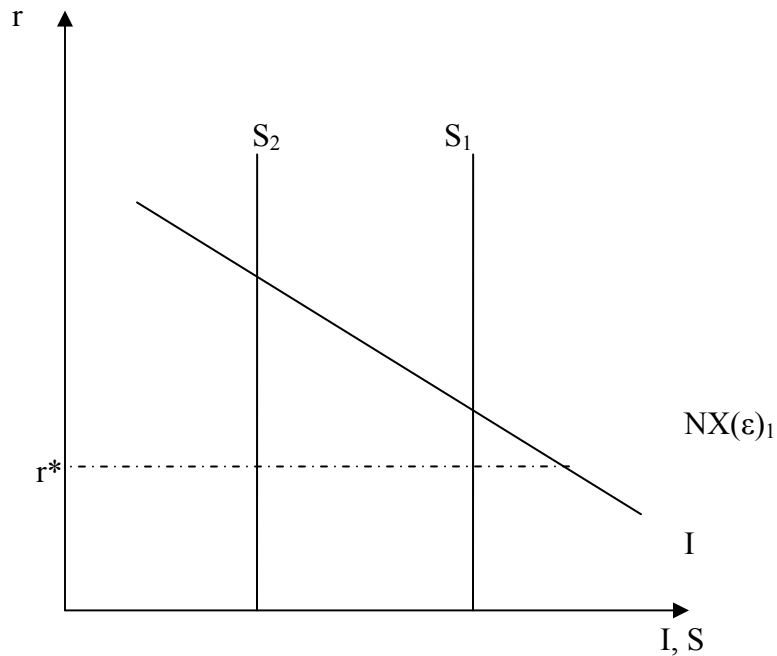
Public saving = $T - G$. Thus public saving will fall by the reduction in taxes plus the increase in G .

Private saving = $Y - T - C$. Disposable income $Y - T$ will rise by the reduction in taxes. Consumption will rise by MPC times the reduction in taxes. Thus, private saving will rise by $(1 - MPC)$ times the reduction in taxes.

National saving is the sum of public saving, which will fall by the reduction in taxes plus the increase in G , and private saving, which rises by $(1 - MPC)$ times the reduction in taxes. Thus, national savings falls by the increase in G plus MPC times the reduction in taxes.

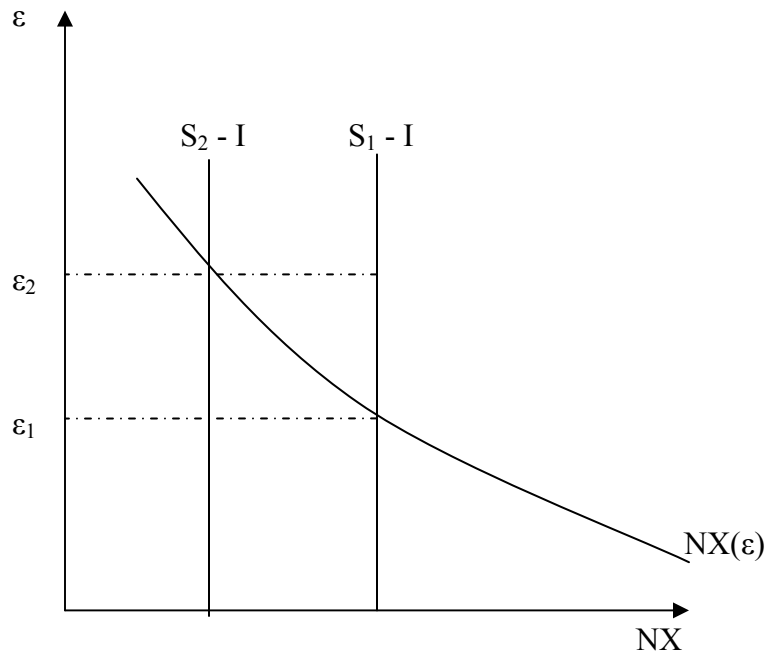
b. Treating the United States as a small open economy with an initial trade deficit, graphically illustrate and state the long-run impact of these tax cuts and increases in government spending on national savings, investment, and the real interest rate.

In a small open economy, the real interest rate is fixed at the world real interest rate r^ . The tax cuts and increase in government spending will shift the S curve left and saving will fall. Neither the real interest rate nor investment (which depends on r) will be affected.*



c. On the appropriate graph, illustrate and state the effects of this program on the United States real exchange rate and net exports if the U.S. were a small open economy.

As S falls, $S - I$ also falls. Thus, the $S - I$ curve shifts left. This increases the real exchange rate and reduces net exports.



5) Suppose the price of a Big Mac hamburger is \$3.06 in the United States and 10.5 yuan in China. Furthermore, suppose the nominal foreign exchange rate is 8.06 yuan per dollar.

a. Calculate the real exchange rate (make sure to label your answer – what is the unit of measurement?)

$\varepsilon = e(P/P^*) = 8.06 \text{ yuan}/\$1 * (\$3.06/\text{Big Mac}) / (10.5 \text{ yuan}/\text{Big Mac}) = 2.34$. This means that for every 1 American Big Mac you can get 2.34 Chinese Big Macs.

b. If the nominal prices of Big Macs remain unchanged in both countries, what would purchasing-power parity theory predict would happen to the real exchange rate? Explain. What about the nominal exchange rate? Explain.

According to purchasing power parity, the real exchange rate will eventually be 1.0. At any other real exchange rate, desired trade would theoretically go in only one direction. Thus we would predict a real exchange rate depreciation.

If we assume that prices are fixed for the time period, we would predict a NOMINAL exchange rate depreciation. Specifically, if $\varepsilon = 1$, then

$$1.0 = e * (\$3.06/\text{Big Mac}) / (10.5 \text{ yuan}/\text{Big Mac})$$

e = 3.46 yuan/Big Mac. If the “law of one price” truly held, this would be the nominal exchange rate.