Economics 227: Intermediate Macroeconomics
Problem Set #3 Answers

1. Suppose the government of a small country passes a new law that requires its Central Bank to maintain a monetary policy that eliminates inflation completely.

   (a) The government of this country imposes a tax on nominal capital gains. If the inflation rate were initially 2%, how might savings and investment change after the law is passed? Assume a closed economy.

   Expected inflation rate falls to $\pi^e = 0\%$. This means that the capital gains tax effectively falls. With a lower inflation rate the same real capital gain translates into a lower nominal capital gain, so taxes are lower. This increases the incentive to save. So the supply of loanable funds rises and the real interest rate falls.

   (b) What is the growth rate of the money supply before and after the law takes effect?

   If real GDP is growing at a rate g, the growth rate of the money supply was originally $2\% + g$, and after the law takes effect falls to g.

   (c) Now assume this country is a small open economy. What is the long-run effect of this law on the real exchange rate? What about the nominal exchange rate?

   Since the law increases the incentive to save, the net capital outflow increases. The law therefore reduces the real exchange rate. The effect on the nominal exchange rate is ambiguous. Recall
   $$\%\Delta e = \%\Delta\varepsilon + \%\Delta P^* - \%\Delta P$$

   Before the law was passed, suppose $\%\Delta\varepsilon = 0$. The nominal exchange rate was growing at a rate $\pi^* - \pi = \pi^* - 2\%$, where π^* is the foreign inflation rate. Now suppose the real exchange rate falls abruptly. The nominal exchange rate will immediately fall proportionally, but then grow at a faster rate than before because the domestic inflation rate falls from $\pi = 2\%$ to $\pi = 0\%$.

2. Suppose the government of a small country promises to cut both taxes and government spending. Furthermore, it promises to cut spending more than taxes in order to eliminate the government budget deficit.

   (a) What is the long-run effect of this plan on public saving, private saving, and national saving?

   Public saving is $T - G$. Since spending falls by more than taxes, public saving rises.

   Private saving is $S_p = Y - T - C = (1 - c_1)(Y - T) - c_0$. Since taxes fall, private savings falls.

   National saving is $S = Y - C - G$. Substitute the consumption function $C(Y - T) = c_0 + c_1(Y - T)$ and rearrange to get $S = Y(1 - c_1) - c_0 + c_1 T - G$. If the government cuts both spending and taxes by \$1, national savings rises by $\$(1 - c_1)$. Since here the government cuts spending by more than taxes, national saving necessarily rises.

(b) In a closed economy, what is the effect of this plan on investment and the real interest rate?

The supply of loanable funds increases, so investment rises and the real interest rate falls. (A complete answer should include a graph.)

(c) If instead the economy is small, open, and has a trade deficit, what is the long-run impact of this plan on national saving, investment, the size of the trade deficit, and the real interest rate?

National savings rises, as before. Since the economy is open, investment and the real interest rate are unchanged: $r = r^*$ and $I = I(r^*)$. The trade deficit shrinks:
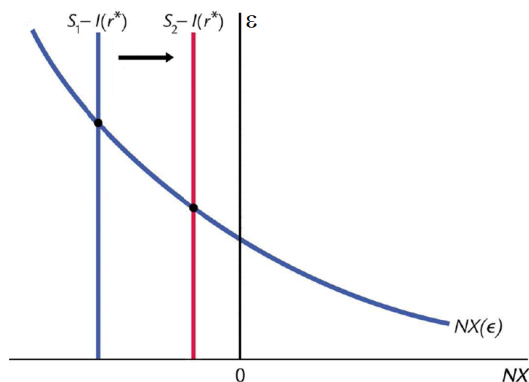
3. Due to continuing reports of the excellence of Lebanese wine, Lebanon is experiencing a continual increase in the demand for its wine.

(a) Do you expect the increasing taste for Lebanese wine to lead to an increasing trade balance surplus or deficit over time? Explain.

The trade balance won't change over time; the real exchange rate will rise:
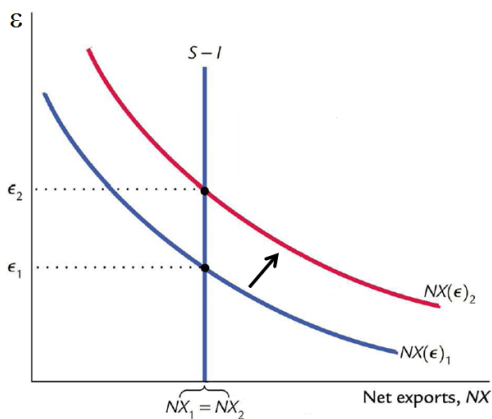
The increase in the demand for Lebanese wine doesn't affect the net capital outflow. The supply of Lebanese lira to finance foreigners' purchase of Lebanese goods is unchanged, but the demand for these lira has increased. So while lira become more valuable, the trade balance doesn't change.

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(b) What other consequences will this increase in the demand for Lebanese wine have for Lebanon's economy, especially the real exchange rate? Is the rising demand for wine likely to help or hurt Lebanon's other industries?

Since the total real value of net exports is unchanged, while the demand for Lebanese wine has increased, the aggregate demand for Lebanese goods haven't changed. The real exchange rate is higher, so exports of goods produced in other industries must be lower.

(c) Can the Banque du Liban prevent this trend from affecting other industries?

In the long run, the Banque du Liban cannot prevent this trend from affecting other industries. The BdL controls the money supply and indirectly the nominal exchange rate, but not the real exchange rate. The real exchange rate is determined by the (real) income and savings of both Lebanese and foreign residents, one of which depend on prices in the long run. If the Banque du Liban increases the money supply then prices P rise and the nominal exchange rate e falls, leaving the real exchange rate ε unchanged.

4. Suppose that consumption depends on the level of real money balances, since real money balances are a part of wealth.

(a) Suppose the Central Bank announces that it will increase the money supply in the future, but doesn't change the money supply now. What happens to velocity? What about real money balances?

Expected inflation rises, so the cost of holding money rises. People demand less money, which increases velocity. Since money circulates more quickly, prices rises. Real money balances $\frac{M}{P}$ therefore falls.

(b) How does this announcement affect consumption, investment, and the real interest rate in the long-run model?

Since real money balances now influence consumption, following the announcement consumption falls. Wealth has fallen because he value of households' money holdings has fallen, so consumption falls. This is turn increases real national savings $S = Y - C - G$ and the supply of loanable funds. r thus falls, stimulating investment.

(c) Does the Fischer effect hold in this case? In other words, does the nominal interest rate increase one percentage point, following a one percentage point increase in expected inflation? Explain.

The Fischer effect no longer holds − money is no longer neutral. Recall $i = r + \pi^e$. The Fischer effect only would hold if the increase in expected inflation leaves the real interest rate constant.