Macroeconomics in an Open Economy

An open economy is one (like our own and most other developed economies) where capital flows freely in and out, affecting both interest rates and exchange rates in the long run. We will look at supply and demand in two markets, the market for loanable funds, which represents the nation’s financial system, and the market for foreign exchange. Each of these markets will be shown in a graph, with a third graph linking the two (thus we can call it “the 3-panel graph”). Long-run equilibrium will be determined jointly in these two markets: for each level of the real interest rate, there will correspond a value for the real exchange rate.

The Market for Loanable Funds

First, a review of the basic equation describing an open economy

\[
\text{(1) } \quad \text{GDP} = C + I + G + (X-M) \quad \text{Output consists of expenditures for consumption, investment spending, government spending and net exports.}
\]

Also

\[
\text{(2) } \quad \text{GDP} = C + S + T \quad \text{From a household’s perspective, income is used on consumption, saving and taxes.}
\]

Since output = income (see the circular flow diagram), we can set (1) = (2) and get

\[
\text{(3) } \quad S + (T - G) = I + (X-M)
\]

where \(S + (T - G)\) is the supply of loanable funds (national savings), the sum of private savings \(S\) and government savings \((T - G)\).

Recall from our discussion of the current situation of the U.S. as a net importer of goods, that every dollar we spend to buy imports above our exports returns to us as a net capital inflow \((M-X) = KI\), for only in this way will it earn a return for the exporting country. Likewise, if we were net exporters, every yen or euro that came in to buy our net exports \((X-M)\) would go out again, as a net financial (or capital) outflow \(KO\).

\[
\text{(4) } \quad (X-M) = KO
\]

Thus, we can rewrite equation (3) as

\[
\text{(5) } \quad S + (T - G) = I + KO
\]

where \(I + KO\) is the demand for loanable funds, which comes from domestic investment spending \((I)\) and investment in foreign countries \((KO)\) (which, unlike domestic investment that excludes stocks and bonds, is any money going abroad to purchase foreign assets).

The variable that makes supply and demand equal is the real interest rate \(i\). If the interest rate is too high for equilibrium, there will be excess supply as savers respond to the high rate of interest, but that high rate will both curb domestic investment and keep money here. The equilibrium level is shown in Fig. 1 below.
This level of the real interest rate will also be a factor in determining the level of net capital outflows – the lower the interest rate here, the more capital will flow to buying foreign assets because their interest rate is now relatively higher. This is shown in Fig. 2.

Fig. 1 Loanable Funds

$$\text{Supply} = S + (T-G)$$

$$\text{Demand} = I + KO$$

Fig. 2 Net Capital Outflows

$$\text{KO}$$

Fig. 3 Foreign exchange

$$\text{Supply} = KO$$

$$\text{Demand} = (X-M)$$

Fig. 3 presents the market for foreign exchange. Recall from equation (4) that $(X-M) = KO$. Net exports are the demand for dollars in the foreign exchange market to buy our exports (the current account). When our exchange rate rises (the value of the dollar rises, say from $1 = ¥100$ to $1 = ¥120$), our exports become more expensive abroad and our imports cheaper, so our net exports are less (or even negative). Likewise, when the exchange rate falls, $(X-M)$ rises. Thus the demand curve for dollars to buy net exports slopes down. The supply of dollars comes from net capital outflows (the capital account) and doesn’t change with the exchange rate, so it is a vertical line and determined by Fig. 2.* The intersection of supply and demand determines the equilibrium real exchange rate.

* Note that this division of currency transactions between supply as KO and demand as X-M is somewhat artificial – unlike the market for goods, where one party is making the goods and the other consuming, here you have no idea whether dollars coming in to the country are to buy our exports, or to buy our assets because we bought their exports. The logic of this division is that the demand for dollars comes from the current account and the supply from the financial account.