Equilibrium in the Goods Market

Equilibrium in the goods market can be described by the following equations:

$$Y = \underset{(+,-)}{C(Y-T)} + \underset{(+,-)}{I(Y,r)} + G - \underset{(+,+)}{\varepsilon IM(Y,\varepsilon)} + \underset{(+,-)}{X(Y^*,\varepsilon)}$$

The volume of imports, IM, depends positively on output, Y, negatively on the real exchange rate, ε. Exports, X, depend positively on foreign output, Y*, and positively on the re exchange rate, ε. We can define the net exports as exports minus imports, X - ε IM

$$NX(Y,Y^*,\varepsilon) \equiv X(Y^*,\varepsilon) - \varepsilon IM(Y,\varepsilon)$$

It follows from our assumptions about imports and exports that net exports, NX depend on domestic output, Y, foreign output, Y*, and the exchange rate, ε. An increase in domestic output increases imports, thus decreasing net exports. An increase in foreign output increases exports, thus increasing net exports. An increase in ε (a real depreciation) leads to an increase in net exports.
Using this definition of net exports, we can rewrite the equilibrium condition as:

$$Y = \underset{(+,-)}{C(Y-T)} + \underset{(+,-)}{I(Y,r)} + G + \underset{(-+-)}{NX(Y,Y^*,\varepsilon)}$$

An increase in the real interest rate leads to a decrease in investment spending and so to a decrease in the demand for domestic goods. This leads, through the multiplier, to a decrease in output.

- An increase in the real exchange rate–areal depreciation–leads to a shift in demand towards domestic goods, and so an increase in net exports. The increase in net exports increases the demand for domestic goods and so increases output.

Equilibrium in Financial Markets

Equilibrium in the financial market implies the supply of money be equal to the demand for money as:

$$\frac{M}{P} = YL(i)$$

We assume that the real demand for money (the right side of equation) depended level of transactions in the economy, measured by real output, Y, and on the opportunity cost of holding money rather than bonds, the nominal interest rate, *i*.

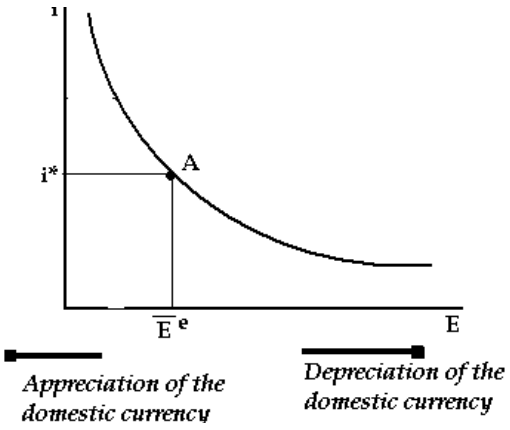
How should we change this characterization now that the economy is open?

In an open economy, the demand for domestic money is still mostly a demand by domestic residents. And the demand for money by domestic residents in any country still depends on the same factors as before: their level of transactions that we measure by real output, and the nominal interest rate on bonds.

Interest Parity Condition:

Given the expected future exchange rate and the foreign interest rate, an increase in the domestic interest rate leads to a decrease in the exchange rate–equivalently, to an appreciation of the domestic currency. A decrease in the domestic interest rate leads to an increase in the exchange rate–to a depreciation of the domestic currency. (i↑ ⇨ E↓) or (i↓ ⇨ E ↑)

A lower domestic interest rate leads to a higher exchange rate – to a depreciation of the domestic currency. A higher domestic interest rate leads to a lower exchange rate – to an appreciation of the domestic currency.



Putting Goods and Financial Markets Together

Goods-market equilibrium implies that output depends, among other factors, on the interest rate and the exchange rate.

$$Y = C(Y - T) + I(Y, i) + G + NX(Y, Y^*, E)$$

The interest rate is determined by the equality of money supply and money demand:

$$\frac{M}{P} = YL(i)$$

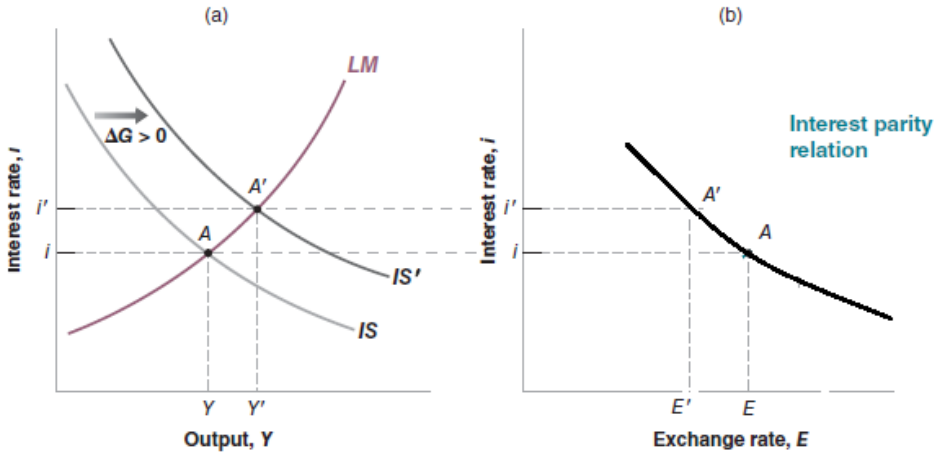
The interest-parity condition implies a negative relation between the domestic interest rate and the exchange rate:

i↑ ⇨ E↓ or i↓ ⇨ E ↑

The Effects of Fiscal Policy in an Open Economy

Suppose that the government decides to increase defense spending without (G ↑). What happens to the level of output? To the interest rate? To the exchange rate? To Net Exports?

An increase in government spending shifting the IS curve to the right, from IS to IS'. Because government spending does not enter the LM relation, the LM curve does not shift. The new equilibrium is at point A', with a higher level of output and a higher interest rate. In panel, (b), the higher interest rate leads to a decrease in the exchange rate–an appreciation of the domestic currency.



$G \uparrow$ shift IS relation to the right that leads to :

Output (Q): increase

Interest rate (i): increase

Exchange rate (ϵ): Decrease (appreciation)

Investment $I(Y, i)$
Y $\uparrow \rightarrow I \uparrow$
$i \uparrow \rightarrow I \downarrow$
Net effect on investment : Investment Uncertain

Net Exports : $NX(Y, Y^*, \in)$

Y $\uparrow \rightarrow NX \downarrow$
$\in \downarrow \rightarrow NX \downarrow$

Net effect on Net exports: $NX \downarrow$

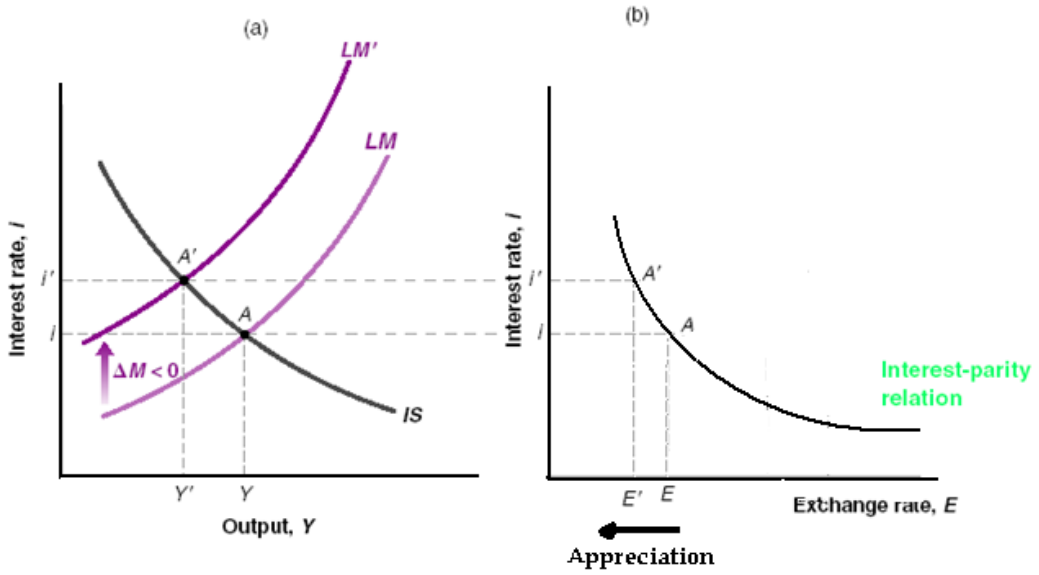
The Effects of Monetary Policy in an Open Economy

A monetary contraction (decrease in money supply)

A monetary contraction, are shown in the Figure. Look at panel (a). At a given level of output, a decrease in the money supply leads to an increase in the interest rate: The LM curve shifts up, from LM to LM'. Because money does not directly enter the IS relation, the IS curve does not shift. The equilibrium moves from point A to point A'. In panel (b), the increase in the interest rate leads to an appreciation of the domestic currency.

So a monetary contraction leads to a decrease in output, to an increase in the interest rate, and to an appreciation of the domestic currency. A monetary contraction leads to an increase in the interest rate; making domestic bonds more attractive and triggering an appreciation. The higher interest rate and

the appreciation both-decrease demand and output. As output decreases, money demand decreases, leading to a decrease in the interest rate, offsetting some of the initial increase in the interest rate and some of the initial appreciation.



$M^S \downarrow$ Shift LM relation to the left that leads to :

Output (Q): decrease

Interest rate (i): increase

Exchange rate (ϵ): Decrease (appreciation)

Investment $I(Y, i)$
Y $\downarrow \rightarrow I \downarrow$
$i \uparrow \rightarrow I \downarrow$
Net effect on investment : Investment decrease

Net Exports : $NX(Y, Y^*, \in)$

Y $\downarrow \rightarrow NX \uparrow$
$\in \downarrow \rightarrow NX \downarrow$

Net effect on Net exports: $NX \ uncertain$