Macroeconomics for E&BE

Lecture 3
24-11-2015
Chapter 6,7
Last weeks we looked at the closed economy, today we are adding net export to our model. We are talking about trade with other countries, so an open economy instead of a closed economy.

Great recession
The great recession began in the industrialized countries where you could easily get a mortgage on your house. If people can't effort their mortgage anymore we speak of a default. The costs of a default is huge but luckily we have insurances. Mortgages with high and low risks on default were packaging in bundles which were sold. Now it became affordable for all people to buy a house because the risk was spread over the bundle of mortgages. This houses became 'ninja' assets (no income, no job, no income). But the seller of the bundles made a mistake. The risks that were packaged in these bundles were not independent. If one mortgage default, the whole bundle would carry the risk. People who traded in the mortgages also carried the costs of the risk when mortgages would turn out in a default, leading to balance sheet problems of commercial banks. This was the main cause of the great recession.
We can see the effects on the economy of the great recession in the IS-LM model. People were not able to pay back the mortgages so they started saving. This means less demand for goods and services so a drop in the production of firms. Firms stopped investing because of the balance sheet problems and the suprime mortgages were less valuable. Banks decreased lending and started to ask a higher interest rate. This caused a decrease in consumer trust so a downward shift in demand of the goods market. Because firms were holding back in investment because of decreasing producer confidence and asking a risk premium (higher than interest rates) on loans, the IS curve shifted to the left.
In order to shift the LM curve to the right to get back at the original interest level, the Central Banks increased money supply. They increased money supply that much that the interest rate was close to zero. Interest can't go below zero so the Central Bank could not do more. This is called the liquidity trap. There was no positive price anymore for borrowing on the capital market. The LM curve could only shift a little to the right, so traditional monetary policy became ineffective.
Since monetary policy has its limits because interest rates cannot go below 0, the only way to recover the economy is shifting the IS curve back (to the right). People had to became confidence to borrow again in order to spend more. The government could spend more or cut taxes, but the debt levels were already high. The CB should support commercial banks such that they start lending again (quantitative easing).

So far, we ignored economic openness. Today we focus on the open economy by dropping the assumption that NX = 0 (net export) and focus on the implications in the (open economy) IS-LM model. In an open economy we will also look at the foreign exchange market which includes currency changes to buy foreign goods.

Economic openness
1. Openness in the goods market
   This includes international trade in goods and services
- Exports = foreign spending on domestic goods (X)
- Imports = domestic spending on foreign goods (IM)
- Trade balance = Net Exports = X – IM

2. Openness in financial markets
   This includes international trade in financial assets. Trading in financial assets requires use of foreign exchange
3. Openness in factor markets (this shows up later in the course)
   This includes international flows of labor and capital

Openness in goods markets

Consumers must decide how much to consume and save. If consumers are not saving they can decide between domestic and foreign goods. When buying foreign goods, goods will flow into the domestic economy. In this decision the price of domestic goods relative to foreign goods is important, which is called the real exchange rate. When disposable income of consumers increases, consumers will consume more and also buying more goods from abroad.

Real exchange rate (ε) = the rate at which one country's goods trade for another country's goods. You can measure if the country is expensive ($\varepsilon < 1$) relative to your home country, or cheap ($\varepsilon > 1$). This is the purchasing power of your goods abroad.
Nominal exchange rate (E) = the rate at which one country's currency trades for another county's currency.

ε = real exchange rate (price of domestic goods in terms of domestic goods)
EP = price of foreign good in domestic currency
P* = price of domestic good in domestic currency

An **appreciation** of the domestic currency is an increase in the price of the domestic currency in terms of the foreign currency, which corresponds to an increase in the exchange rate.
A **depreciation** of the domestic currency is a decrease in the price of the domestic currency in terms of the foreign currency, which corresponds to a decrease in the exchange rate.

Openness in financial markets

Financial investors hold both domestic and foreign assets and speculate on foreign interest rate movements. Countries run a trade surplus if $NX > 0$ and a trade deficit if $NX < 0$. A country that buys more than it sells must pay for the difference by borrowing from the rest of the world. The situation now is:

$Y = C + I + G + NX$
We can rewrite this as
$Y - C - G = I + NX$
$S = I + NX$
$S - I = NX$

When $S - I > 0$, the country is a net lender. More assets are saved than invested domestically, capital flows abroad. This means $NX > 0$, the country has a trade surplus. When $S - I < 0$, more assets are invested and saved, capital has to flow into the country. This means $NX < 0$, the country has a trade deficit.

The decision to invest abroad or at home depends on interest rate differences, the exchange rate and the future exchange rate.

If domestic and foreign bonds are to be held, the expected return on holding bonds at home and holding bonds abroad should be equal, so the following arbitrage condition holds

We can say that

The domestic interest rate is equal to the foreign interest rate minus the expected rate of appreciation of the domestic currency. Financial investors do not always invest in bonds with the highest expected return because of transaction costs and risk. But overall, the interest parity condition does (approximately hold).
There is a positive relationship between i and E. If the interest rate of a foreign country increases, the interest rate of the domestic country is lower so it is relative cheaper to invest in the domestic country. This will lead to an appreciation of the domestic currency because of more demand for the currency.

The open economy IS-LM model
The IS-curve = all combinations of the interest rate and the income level for which the goods market is in equilibrium. In the open economy we incorporate imports and exports.
The LM-curve = all combinations of the interest rate and the income level for which the money market is in equilibrium. In the open economy the equilibrium interest rate has implications for the choice between foreign bonds and, hence, the exchange rate.

The goods market is almost the same as in the closed economy, except now:

- The demand for goods contains exports and imports. Imports are subtracted and have to be adjusted for the domestic price level.
- Imports depend positively on the income level and positively on the real exchange rate.
- Exports depend positively on the income level abroad and negatively on the real exchange rate.

The only new equation is .
In the IS-LM model the relation between domestic interest rate and the income level is the same as in the closed economy. The IS-curve is still downward sloping, but the slope has changed.

The money market is just the same as before because the supply of real money is still exogenous and the demand for real money is mostly a domestic affair. The equation for the LM-curve will still be .
Yet, from the interest parity condition we know that the equilibrium interest rate has implications for the equilibrium exchange rate.

Using the IS-LM model for the open economy we can draw a graph in which we can see the relation between interest rate and the exchange rate (see slide 31, lecture 3). This graph illustrates the foreign exchange market.

Fiscal policy in the open economy
Expansionary fiscal policy will lead to an increase in an appreciation of the exchange rate. An increase in G stimulates domestic demand leading to an increase in production. This causes an increase in money demand which results in an increase in the interest rate. An increase in interest rate is accompanied by an appreciation of the exchange rate. There will be a new equilibrium where consumption has increased because of a higher income (Y). The effect on investment is ambiguous (higher Y and i). Net exports have decreased because of a higher Y and E.

Expansionary monetary policy will lead to an depreciation of the exchange rate and a higher income. An increase in the money supply decreases the interest rate. This makes domestic bonds less attractive and causes a depreciation of the currency. The lower interest stimulates investment. The depreciated currency leads to higher net exports. Both effects increase income. The exchange rate has changed now. If the exchange rate is fixed, the Central Bank has to keep the interest rate at a fixed level. In this case, monetary policy would be impossible like we saw in the Great Recession.