

10 Macroeconomics of an open economy

Usually macroeconomics theory is first taught with a closed-economy model, i.e., an economy that doesn't trade at all with any other country. However, economies nowadays trade a lot between them. That's why we provide in this section the explanation of macroeconomics for an economy that trades goods, services, and financial resources with other countries.

10.1 Exports and Imports

A closed economy has a GDP equal to

$$GDP = C + G + I$$

For an open economy, as cited before, we have

$$GDP = C + G + I + XN$$

Where

XN : Net Exports, i.e., exports minus imports.

Exports are the total value of goods and services that a country's firms supply to the rest of the world. Imports are the total value of goods and services that a country's firms demand from the rest of the world.

10.2 Net Capital Outflow

We can not only trade goods and services, we can also trade financial assets. For example, a Portuguese trader can buy stocks from the US economy and vice versa. As with net exports, we can also think of net "capital outflows", i.e., the difference between the purchase of international assets by the country's households and firms and the purchase of the country's assets by international citizens.

$$NCO = A - B$$

Where

NCO : Net capital outflow

A: Purchase of international assets by the country's citizens

B: Purchase of the country's assets by international citizens

These flows can be divided into two categories: Foreign direct investment and foreign portfolio investment. The former relates to Amazon initiating operations in India, investing resources to open buildings and services there. The latter is about having traders or investors buying financial assets in India.

NCO can be positive or negative. We should say that, in any country, if we export goods or services to another country, we are increasing our country's exports. What can we do with the foreign currency? We can save it (we hold a foreign asset) or use it to buy goods, services or financial assets of that country, consequently, we would be increasing the NCO. On the other hand, as an Indian resident, if we import the Microsoft operating system for our computer, we are using rupees to buy that good. Then Microsoft can use those rupees to save it (the Indian currency is an asset held by an international firm) in a local bank account or invest it in Indian financial assets.

Are you getting the point? We can say that

$$NCO = XN$$

This equation relates the net capital outflow with the net exports. This equality must hold always for any country.

10.3 Saving and Investment in an Open Economy

We can change our equation of Savings = Investment from a previous section to incorporate the new concept

$$\begin{aligned} Y &= C + I + G + NX \\ Y - C - I - G &= NX \\ S &= I + NX \end{aligned}$$

Where

S: Savings

I: Domestic Investment

NCO: Net Capital Outflow

10.4 Exchange rates

We have talked about national and international currencies. You may already know, as a trader, that you can have prices of each currency with respect to other currencies. That is what we call the "exchange rate".

An exchange rate is the price of a currency in terms of another currency. For example, the EURUSD is the price of a single euro based on units of the dollar. An example of EURUSD is 1.15, which means one euro (the base currency) is worth 1.15 units of dollars (the price currency).

In the case of the EURUSD increase, we say that the euro has an appreciation in value. On the other hand, if it decreases, we say that the euro has a depreciation in value. Be careful! We don't say appreciation or depreciation for the exchange rate, we apply those two words only while talking about the currencies.

However, you can ask the following question: Why couldn't we define the dollar based on the euro? Yes, that's right! We can have as the base currency the dollar and the euro as the price currency. Taking our example from above, we only need to raise the 1.15 to the (-1) power.

$$USDEUR = 1.15^{-1} = 1/1.15 = 0.87$$

We should keep in mind that there are "common" ways to form a foreign exchange pair. For example, as for the euro and dollar, it's usually priced as euro based on the dollar, i.e., EURUSD. For the relationship between the GBP and USD, it's usually GBPUSD, etc.

Exchange rates are an important variable in macroeconomics. It has strong relationships with the other macroeconomic variables. We'll see that later.

10.5 Real and Nominal Exchange rates

Do you remember we talked about our salary in nominal and real terms? Guess what? We can also have nominal and real exchange rates!

The nominal exchange rate is what we learned in the previous section. In case the exchange rate base currency is the domestic currency and the price currency is the foreign currency, the real exchange rate can be computed as

$$RER = \frac{ER * FP}{DP}$$

Where

RER: Real exchange rate

FP: Foreign price index

DP: Domestic price index

In case the nominal exchange rate base currency is the foreign currency and the price currency is the domestic currency, then the real exchange rate is:

$$RER = \frac{ER * FP}{DP}$$

We say index referring to a consumer price index or the GDP deflator.

10.6 Purchasing power parity

What if we want to compare the purchasing power (or cost of living) between different countries? You might use, the CPI of the US to compare it with the CPI from India. However, you wouldn't take into

account the differences between each currency value. You would need the exchange rate in order to compare them.

Purchasing power parity is a macroeconomic term which states the following: Assuming no transaction costs and trade barriers, the price of one good in country A should be equal to the price of the same good in country B. This is also known as the “law of one price”.

Say, for example, that a computer costs 1,000 dollars in the US and in India it costs 80,000 rupees, this means the exchange rate should be exactly

The Exchange rate based on PPP = $80,000/1,000 = 80$ rupees per dollar.

If PPP holds, the exchange rate should be such that the prices of the same good should be equal.

Can you guess what the real exchange rate is for the above example? Let's find out

$$RER = \frac{80 * 1,000}{80,000} = 1$$

So the PPP states that the real exchange rate is 1 for any comparison between 2 countries.

As we said, we used assumptions, no transactions and no trade barriers. However, these two assumptions don't occur in reality. But as gravity serves as an explanation in physics to understand why a mass can pull objects to its centre, the PPP also serves as an explanation in economics to understand that the countries' cost of living will fall in the gravity of the PPP.