Lecture notes 5: 
Open economy long-run equilibrium

We continue to consider just the real aspects of long-run macroeconomic equilibrium. The implicit assumption is that monetary factors are neutral. When we think about inflation in that context, we envisage all prices increasing at the same rate. When we talk about the interest rate, it is the return on real capital, and not a variable that might be affected by monetary policy. There is no monetary policy, there is no money, in the model. Likewise when we open up the economy: the exchange rate is a real exchange rate, adjusted for relative price levels, and in long-run equilibrium it is not affected by monetary factors.

The role of monetary policy in the real world is without doubt very important. In the long run it is responsible for the rate of inflation. In the short run monetary policy has a considerable influence over real as well as nominal interest rates and exchange rate, and hence over the level of economic activity. It can speed up or impede the adjustment process to full equilibrium. That is why the central bank is so often in the news. But we will get to this later, after seeing the market mechanism for long-run equilibrium.

1. Balance of payments

Net exports or current account
Overall
Net exports \((X - M)\) add to the flow of spending in the economy:

\[ Y = C + I + G + (X - M). \]

\(X\) and \(M\) comprises goods (merchandise) and services—final output. The current account excludes transactions in existing assets and financial assets.

Merchandise
Canada has a large merchandise trade surplus. Goods exports include:
- forest products (pulp and paper, lumber)
- automobiles
- energy products (oil, gas, electricity, etc.)
- metals and minerals (nickel, aluminium, diamonds, etc.)

Services
Canada is a large net importer of services (or “invisibles”). The imports include:
- royalties and patents (books, films, music, software, etc.)
- tourism (air travel, car rentals, hotels, etc.)
- insurance
The balance of trade in goods and services is also called net exports.

**Factor payments abroad**

The current account of the balance of payments is equal to the trade balance plus the balance on external factor payments (*NFP*). *NFP* is a large negative item in the Canadian balance of payments because of the large net interest and profits payments on Canadian assets owned by foreigners.

**Overall Canadian current account position**

Historically the deficit on services and NFP outweighed the surplus on goods, so that Canada’s current account was negative for most of the 20th C. The deficit in many years was at least 1% of GDP, and much greater than this in the early years of the 20th century. Just before 2000, however, the current account swung into surplus.

**Capital account**

**Asset transactions**

The capital account refers to transactions in *assets*—financial (government bonds, foreign mutual funds, etc.), or existing real assets (buildings, diamond mines, etc). Note this important distinction:

- *portfolio investment*, which is just for the return: regular purchases of foreign bonds and shares, bank loans, etc.
- *direct investment*, which involves control as well as return: take-overs e.g. 2004 San Francisco’s Vector Capital buy-out of Ottawa’s Corel; expansion of branches in Canada by foreigners, e.g. Ford, Wal-Mart, etc.; a house purchase by a foreign resident…

**Accounting definition**

By definition, the balance of payments balances. A *current account surplus*, is a *capital account deficit*.

\[ CA = -KA \]

The counterpart to any surplus in current transactions is an accumulation of assets abroad—a net export of capital.

Thus, the easiest way to understand the Canadian *current account deficits* of the 20th century is to look at the *capital account surpluses*. These reflected massive capital imports (much of it direct investment), necessary for the development of the vast spaces and natural resources.

**Perfect capital mobility**

Perfect capital mobility implies that there are no impediments to movements of capital across the border. This has been pretty much the Canadian case for many years. Investors go wherever the expected returns are highest, borrowers to where the cost of credit is lowest. This process of arbitrage tends to eliminate differences in yields between countries.
In a hypothetical world, with no frictions or risk premiums, interest rates adjusted for expected exchange movements would be equalized: uncovered interest parity (UIP) would hold. As a special case, if the exchange rate was rigidly fixed, and exempted to remain so, the domestic interest rate would be equal to the foreign rate—we see this situation in Europe—e.g. Denmark fixes its krone to the euro, and yields on government bonds are very close to those in the euro zone.

Risk premium
Countries have varying credit ratings. Canada ranks somewhat lower than the US, so there investors demand a small risk premium, over the above the US yield, to buy Canadian assets. As regards financial assets, e.g. federal government bonds, the US market is bigger and more liquid, so there is also a small liquidity premium—we will lump this into the Canada risk premium.

Saving and investment

Spending

\[ Y = C + I + G + (X - M) \]

Disposition of income

Where \( S_p \) is private saving, NFP is net factor receipts from abroad:

\[ Y + NFP = GNP: \]
\[ Y + NFP = C + S_p + T \]

Saving-investment and the balance of payments

\[ I + G + (X - M) + NFP = S_p + T \]

or

\[ S_p + (T - G) - I = X - M + NFP = CA, \]

where \( CA \) is

or, where \( S_g \) is government saving

\[ S_p + S_g - I = CA \]

which is equivalent to the following statements:

private saving plus government saving minus investment = trade surplus
private saving plus budget surplus minus investment = trade surplus.

Since national saving, \( S = S_p + S_g \):

\[ S - I = CA = -KA \]

national saving minus investment = capital account deficit

The equation can be rearranged:

\[ I = S + KA \]

that is:

investment = national saving plus capital account surplus
investment = national saving plus imported saving
2. Model for small open economy

Investment-saving: balance of payments
Perfect capital mobility and risk premium

For a small open economy, with perfect capital mobility, we write

\[ r = r^* + \theta \]

where \( r^* \) is the world interest rate, and \( \theta \) is the country risk premium. For simplicity in what follows we ignore the risk premium (i.e. set \( \theta \) to zero).

Equilibrium

Recall the investment function?

\[ I = I(r) \]

becomes

\[ I = I(r^*). \]

In equilibrium we now have

\[ I(r^*) = + (M - X) \]

Figure 5.1: Equilibrium with trade deficit

In this example the world interest rate is below the closed-economy equilibrium rate. The economy imports savings (capital account surplus = current account deficit \( M - X \)). In other words, to meet all the investment demand, the country imports more goods than it exports, and so accumulates foreign liabilities. In the figure, the deficit is \( AB \).
One experiment …

Figure 5.2: Domestic fiscal expansion

Another experiment…

Figure 5.3: Fiscal expansion in rest of world

Left quadrant: ROW can be treated as a closed economy. Their increased budget deficits reduce world saving (shift the world saving line to the left), which raises the world interest rate from $r^*_1$ to $r^*_2$. Right quadrant: the increased interest rate reduces domestic investment, and therefore reduces the trade deficit—in Figure 5.3 completely eliminating the deficit.
**Exchange rate**

**Nominal price of foreign exchange** $E$

Nominal $PFX$ is simply the price you see quoted, e.g. C$ 1.32 for US$ 1.00. (Economists usually prefer to write the exchange rate this way, instead of the reciprocal US$ 0.76 per C$ 1.00—which M&S unfortunately choose.)

**Real price of foreign exchange**

Real $PFX$ adjusts for changes in price levels. For example, you use CPIs to calculate a real price for the C$ in terms of US$ ($e$):

$$ e = E \frac{CPI_{CAN}}{CPI_{US}} $$

The real price in Canada of US goods could increase via a decrease in nominal $E$, (C$ worth less against US$) or a more rapid rate of inflation in the USA.

The *absolute level* of the real exchange rate has no meaning as such, since the choice of the base years for the price indexes is arbitrary. It is therefore convenient to express the real exchange rate as an *index*, with a value of unity in some base year. One is interested only in the *movement* of the index over time, not the level.

**Competitiveness**

The calculation can be done using a cost measure (e.g. unit labour costs), instead of the CPI. The resulting index is often called a *competitiveness index*, because it shows the movement in exchange-rate adjusted relative costs. A decrease in the real exchange rate would represent a gain in competitiveness.

**Purchasing power parity**

PPP applies when the nominal exchange moves in line with the inflation differential (i.e. if $E$ falls at a rate equal to the domestic-foreign inflation differential) the real exchange rate is constant. If inflation were perfectly neutral in its impact, this would happen. In practice, there is a tendency towards PPP in the US$ /C$ rate, but it is a very slow process.
**Exchange rate in open economy model**

Net exports are an increasing function of the real price of foreign exchange. (Note the complaints from manufacturers over the past year, following the 20% decline in the C$ price of the US$.)

\[ X-M = XM(pfx) \]

**Figure 5.4: Net exports as function of real exchange rate**

**Equilibrium exchange rate**

Remember in Figure 5.1 the equilibrium trade deficit was AB? From Figure 5.4 we can see what this implies for the equilibrium exchange rate. The exchange rate consistent with that deficit is \( e_1 \). No other price of foreign exchange would generate deficit AB.

**Am exogenous shock**

**Figure 5.5: A decrease in export demand**

The exchange rate consistent with net exports AB falls to \( e_2 \). The domestic currency **depreciates** in value.
**Fiscal policy and the exchange rate**

The implications of fiscal policy for the balance of payments are clear: one expects a positive correlation between the budget surplus (deficit) and the trade surplus (deficit). This is well substantiated empirically in Canada, following over the past 20 years. M&S present evidence to the same effect for a range of countries.

The long-run effect on the exchange rate, however, is not so simple.

**Figure 5.6: Domestic fiscal expansion—short run**

An increased government deficit reduces national saving and, hence the external current account balance. Here, the current account deficit rises from AB to CB. Equilibrium entails a rise in $e$ (an appreciation of the domestic currency), to $e_2$.

In the US, in the early 1980s, and in Canada, in the late 1980s, as government spending rose rapidly, the respective dollars did indeed strengthen on exchange markets.

This, however, will not be the end of the story. It is a short-run, not a long-run equilibrium. Over time accumulation of debt creates increasing outflows of interest payments, which increase the current account deficit at a given level of the exchange rate. Foreign debt/GDP ratio would be constantly rising. Growing debt and deficits would reduce $e$. This would improve the merchandise balance, and so restore the overall current account to sustainability (in a growing economy, the balance need not be zero to stabilize the debt/GDP ratio).

As compared to the initial equilibrium, the decline in the current account would be entirely accounted for by increased net factor payments; the merchandise balance must improve to make servicing the debt possible.

Thus, there is a complex dynamic in the response of the currency to fiscal policy. Example: Paul Martin's tough 1995 budget was followed for a few years by a very weak C$, but the strong improvement in the budget position eventually led to a strong current account and a rise in the C$.