Lecture #5: Exchange Rates in the Short Run and the Long Run

1. Money Demand. The attached figure shows velocity versus the rate of interest. Note how velocity is a little higher now than it was in the late 1960's when the rate of interest was roughly what it is now. We can use this difference to 'estimate' the money demand equation. Let's posit the following money demand equation:

$$\frac{M}{P} = f(R) \times Y^{\gamma},$$

where γ is a parameter, whose value we will estimate. In the previous lecture we talked about the version of this equation that is commonly used, the one in which $\gamma = 1$. The parameter, γ, is the elasticity of demand for real balances with respect to an increase in income, holding R fixed. This statement reflects two things. First, the elasticity of demand for M/P with respect to Y is defined as the percent increase in M/P demanded, when Y rises by one percent. Second, with the above equation, the percent increase in M/P with a one percent increase in Y is approximately γ.

We can estimate γ in the following way. The attached figure (taken from Lecture #4) indicates that velocity now is around 2.3, and it was around 2 in 1967. Thus, it increased by 15 percent. At the same time, output (after inflation) has increased 130 percent over the same period. How can we use this information to estimate γ?

Recall the definition of V, velocity. It is $V = Y/(M/P)$. Rewriting the above equation, we find,

$$V = \frac{1}{f(R)} \times Y^{1-\gamma}.$$

Approximately,
$$\%\Delta V = (1 - \gamma)\%\Delta Y,$$

where $\%\Delta$ means 'percent change'. Plugging in the numbers from above, we get that $1 - \gamma$ is 15/130, or that γ is 0.88. Later, we'll find that this number is useful for figuring out what money growth rate will hit a given target inflation rate.

2. The Short Run.

(a) Combine UIP and the model of the money market, and assume E^e, Y, P are fixed.
Rationale for fixed P assumption:

    i. a lot of prices are fixed by contract. In addition, a lot of costs (like wages), which go into determining prices, are fixed by contract too.
    ii. prices move very little from one month to the next, compared to exchange rates (see Fig 14-11).

Rationale for fixed Y assumption: increasing production requires a lot of advanced planning and takes time.

(b) Experiments: increase in US money supply drives down $R_\$$ and results in currency depreciation, E goes up; increase in German money supply drives down R_{DM} and results in (US) currency appreciation, E goes down.

3. The Long Run.

(a) A permanent increase in M results, in long run, in a proportional increase in P and no change in R, Y.

(b) Rationale:

    i. Permanent increase in M is much like a currency reform, and don't expect this to impact on R or Y.
    ii. Countries with big increases in M have big increases in P (see Italy in Figure 14-10, and the Latin American countries in the case study on page 386, and attached data on Bolivia, taken from page 391 of KG).

(c) A permanent increase in M results, in the long run, in a proportional increase in E.
Rationale:

    i. countries with big rise in M also have big depreciations. Example: Bolivia data on attached figure, taken from page 391 of KG.
    ii. E is a price (it's the number of dollars it takes to buy one unit of foreign currency), so the notion that, in long run, E rises in proportion to rise in M seems consistent with notion that all the prices summarized in P rise in proportion to M in the long run.

(d) Experiment: Permanent increase in US money supply. Important result: exchange rate overshooting.

Money velocity (MZM from St Louis Fed) and Opportunity Cost

x 10⁴ April 1984-October 1985

April 1984-October 1985

x 10⁵ April 1984-October 1985

Bolivian M1

Bolivian Price Level

Bolivian Exchange Rate

M

P

E

month

month

month

Bolivian M/P, April 1984 - October 1985

Bolivian E/P, April 1984 - October 1985

M/P

E/P

month

month