Market exclusion

Let's drop interest rates for now and return to our second way of disciplining a debtor; Market exclusion.

- If debtors default they loose access to financial markets
- Can lead to liquidity constraints
- Less access to insurance

Infinite horizon models with debt and uncertain endowments are complicated and not straight forward to solve. Countries will not be able to maintain constant consumption if they are sufficiently unlucky and approach their borrowing limit.

I will rather present the insurance example from chapter 6.2 in OR. This is similar in the sense that countries has an obligation to pay a sum of money conditional on a shock and they might choose to default on that payment.

Market exclusion II

Let's focus on an insurance problem. Here we don't have debt levels growing over time, but the country will at each point in time either receive a transfer or pay a transfer according to a contract. These payments can be defaulted on just as repayment of debt.

A country is inhabited by a representative consumer and the country has an insurance contract with other countries.

$$U_t = E_t \left[\sum_{s=t}^{\infty} \beta^{s-t} u(c_s) \right] \tag{8}$$

with the budget constraint:

$$\begin{aligned} B_{s+1} &= (1+r)B_t + Y_s - c_s - P_s(\epsilon_s) \\ Y_s &= \overline{Y} + \epsilon_s \\ \epsilon_s &\sim i.i.d., \text{ mean zero with upper and lower bounds } [\underline{\epsilon}, \overline{\epsilon}] \end{aligned} \tag{9}$$

ϵ_s is the shock in period s and $P_s(\epsilon_s)$ is the insurance payment in period s.

Market exclusion III

In the complete market setting, assuming $\beta(1+r)=1$, the insurance contract specifies insurance payments (positive or negative), $P_s(\epsilon_s)$, such that the country can obtain constant consumption equal to $\overline{Y}$.

But is this contract incentive compatible?

As in the case with direct sanctions a country has the incentive to default on the insurance payment if the gains are larger than the costs. Here the gains are large if GDP is high (positive ϵ_s), because this is where the country has to make a payment. The cost is permanent exclusion from insurance markets, which means consuming your uncertain endowment forever. In period t the cost and gain will look like this:

$$\begin{aligned}\text{Gain:} &= u(\overline{Y}+\epsilon_t)-u(\overline{Y})\\ \text{Cost:} &= \sum_{s=t+1}^{\infty}\beta^{s-t}u(\overline{Y})-\sum_{s=t+1}^{\infty}\beta^{s-t}E_t u(\overline{Y}+\epsilon_t)\end{aligned}$$

Gains are large when the outcome of the shock is high. Costs are large when β is high and the variance of the shock is high.

Market exclusion IV

For this to hold for all realizations of the shock it suffices to show that it holds for the highest possible value of the shock, $\overline{\epsilon}$. The condition will be:

$$Gain(\overline{\epsilon}, \overline{Y}) \leq Cost(\overline{Y}, \beta, Var(\epsilon))$$

$$u(\overline{Y} + \overline{\epsilon}) - u(\overline{Y}) \leq \frac{\beta}{1-\beta}[u(\overline{Y}) - Eu(\overline{Y} + \epsilon)]$$

where I have used the formula for an infinite geometric sum on the right hand side.

Market exclusion V

Relating the insurance model to a model of debt:

If we consider the payment on the insurance contract to be an interest rate payment instead, all results are comparable. Higher interest rate payments makes a country more likely to default. The main difference is that in the insurance model high payments are always accompanied by high output, Y_s. This might not be the case when talking about debt. If a country accumulate debt over time by having many bad shocks in a row debt will rise and interest rate payments might be high when GDP is low.

The maximum debt level will thus be a function of the worst possible outcome of GDP, together with the patience, β, of the debtor country and the variance of shocks. It will be set so that the gains of default never exceed the costs of default.

$$Gain(B_s, Y_s) \leq Cost(\beta, Var(Y_s))$$

Market exclusion VI

How important is market exclusion in reality?

- Studies have found that the frequency of default does not affect access to credit markets.
- It takes relatively short time from default until you are back in the game.

Period		Years until resumption
1980	Mean	5.2
	Median	4.0
1990s	Mean	2.9
	Median	2.0
1980-2000	Mean	4.7
	Median	4.0

Table: Gelos, Sahay and Sandleris 2011