

Financial Integration and Crises

Sample Questions 2

1) Consider a simple two-period model of prices, output, money and interest rates in which agents have the following preferences:

$$U = \ln(C_1) + \beta \ln(C_2)$$

where $\beta \in [0, 1]$ is the discount factor. C is consumption good. Individuals need cash to buy consumption goods (cash in advance constraint):

$$P_t C_t \leq M_t$$

The government runs a balanced budget every period so that

$$\frac{M_t - M_{t-1}}{P_t} = G_t - T_t$$

where T denotes lump-sum taxes, G_t the level of government expenditure and M_0 is the initial stock of money. The individual budget constraint would be:

$$B_{t+1} + M_t = (1 + i)B_t + M_{t-1} + P_t(Y_t - C_t - T_t)$$

where B_1 denotes the initial stock of bonds.

i) Derive the intertemporal budget constraint of the consumer (keeping into account the government budget constraint). You can assume that initially $B_1 = M_0 = 0$.

ii) Determine, in the context of an economy with flexible prices, under which conditions the real interest rate could be negative and the economy could end up in a liquidity trap.

iii) Consider now an economy in which prices are sticky in the first period and flexible in the second period so that $P_1 = \bar{P}_1$. Show how to determine output and the nominal interest rate in the first period.

iv) Suppose now that the full capacity output in the first period is above the equilibrium level but you are in a liquidity trap situation so that the nominal interest rate is at zero. Could you achieve the desired output level by varying the level of public expenditure, G ? Explain the intuition for your answers.

2) Consider a two-country endowment economy in which households' preferences are specified as follows. For the home economy

$$\sum_{t=0}^{\infty} \beta^t \log C_t,$$

while for the foreign economy we have

$$\sum_{t=0}^{\infty} (\beta^*)^t \log C_t^*$$

where C_t and C_t^* denote, the home and foreign consumption at time t and β, β^* represents the home and foreign subjective discount factor, with $\beta^* < \beta$. There is a risk free bond expressed in units of the consumption good that is traded between the two economies. The total world endowment of the consumption good is denoted by Y and each economy receive the same share of endowment every period (i.e. there is no idiosyncratic risk). The period budget constraint for the home and foreign economy are then given by:

$$B_t = (1 + r_{t-1})B_{t-1} + \frac{1}{2}Y - C_t$$

$$B_t^* = (1 + r_{t-1})B_{t-1}^* + \frac{1}{2}Y - C_t^*,$$

where $B > 0$ denotes credit position and $B < 0$ denotes debit position. Agents in each economy face a borrowing limit of the following form:

$$0 > B_t(1 + r_t) > B^{high}$$

$$0 > B_t^*(1 + r_t) > B^{high}$$

1. (a) Compute the steady state equilibrium for home, foreign consumptions and the world interest rate for this economy..(Hint: keep in mind that the foreign economy is relatively impatient, $\beta^* < \beta$, and as such it will face the borrowing limit in the steady state)
- (b) Consider now the following experiment in which the debt limit is reduced from B^{high} to B^{low} . Determine the new steady state and discuss how it differs from the one computed in part (a).
- (c) Consider now the transition between the old and the new steady state. Assume that the transition takes only one period and determine the short-run values for home, foreign consumption and the world interest rate. Under which conditions the world interest rate can be negative?
- (d) Suppose now that both economies issues also nominal bonds in zero net supply and can be traded only within each economy. Denote with P_t, P_t^* the price level for the home and foreign economy respectively with $P_t = P_t^*$. Discuss how the world interest rate and the home and foreign consumption change in this case, during the one-period deleveraging transition, if there is a zero lower bound on nominal interest rates.
- (e) Suppose now there are no real bonds and the only assets that are traded are home and foreign nominal bonds. The debt limit now becomes

$$\frac{B_t^{nom}}{P_t}(1 + r_t) > B^{high}$$

for the home economy and

$$\frac{B_t^{nom}}{P_t^*}(1 + r_t) > B^{high}.$$

Consider as before the experiment in which the debt limit is reduced from B^{high} to B^{low} and assume that the transition from one steady state to the other takes only one period. Determine the short-run value of home, foreign consumption and the world interest rate and compare your results with the one obtained in part (c).

3) Consider a two-sector small open economy with the following preference specification

$$\gamma \log c_1^T + (1 - \gamma) \log c_1^N + \beta \gamma \log c_2^T$$

so that the economy consumes tradables and non-tradables in the first period but only tradables in the second period. The economy receive an exogenous endowment for (y_1^T, y_2^T, y_1^N) and faces the following international borrowing constraint that limits the amount that the consumers could borrow in the first period.

$$b_2 > -\kappa(y_1^T + p_1^N y_1^N)$$

1. (a) Determine the equilibrium conditions for the tradables and non-tradables goods markets and the optimal intratemporal allocation between tradables and non-tradables consumption.
- (b) Consider first the scenario in which the credit constraint never binds. Determine the consumption function for tradables and the relative price of non tradables under this scenario for the case in which $\beta(1 + r) = 1$ and the endowment of non-tradables is time invariant.
- (c) Consider a shock to the leverage ratio $\kappa > 0$ from κ_0 to $\kappa_1 < \kappa_0$. Determine the size of the shock to κ_0 for which the borrowing constraint binds.
- (d) Determine the equilibrium allocation of consumption for tradables and the relative price of non-tradables in period $t=1$ under the scenario that the constraint bind and compare it with what you got in part (b). Describe the Fisher deflation mechanism with the help of a graph in the context of this model to explain how the borrowing constraint amplifies the response of prices and quantities following the endowment shock in period $t=1$.

Short Questions:

- 4) Is monetary policy effective at the zero lower bound?
- 5) What are the channels under which quantitative easing stimulates the economy?
- 6) What is the logic behind the sovereign debt crisis model a la Calvo? To what extent do you think it is a valuable model to capture the Eurozone sovereign debt crisis?
- 7) Discuss the paradox of toil and the paradox of flexibility explaining the mechanism through which these paradoxes arise.