

Economics 170  
**International Macroeconomics**  
Homework 8  
Due April 14, 2008

1. Consider an economy with an external debt  $D$ . Assume that the economy's capacity to honor its debt is state dependent. Specifically, there are 2 states. In the good state the country can pay its debt in full. In the bad state the country can at most pay 20. The probability of the bad state, which we will denote by  $\pi(D)$ , is given by  $\pi(D) = 0.01D$ .
  - (a) Suppose that the country's debt is 80. What is the secondary market price of debt? Would private creditors be willing to forgive 10 units of debt?
  - (b) Suppose now that the country's debt is 50 and the Jubilee 2000 Committee agrees to buy back 10 units of debt in the secondary market. What price will the Jubilee 2000 Committee have to pay for each unit of debt it buys back? What is the total cost of the operation? By how much does the expected income of creditors increase? By how much do the expected payments of the debtor country decline?
2. Consider a country with an outstanding debt of 100. The country experiences 2 possible states of the world, a good state and a bad state. In the good state the country pays the outstanding debt in full. In the bad state the country pays only 25. If the outstanding debt is less than or equal to 80, then the probability of the good state is  $1/2$  and the probability of the bad state is  $1/2$ . However, if the outstanding debt is higher than 80, then the good state occurs with probability  $1/3$  and the bad state with probability  $2/3$ .
  - (a) In the absence of debt forgiveness, what is the market price of debt?
  - (b) How much debt would creditors as a group like to forgive? What is the market price of debt in this case?
  - (c) What is the maximum amount of debt creditors would be willing to forgive?
3. A Debt Swap

Suppose a country has 100 units of debt outstanding. In the good state of the world the country can repay its debts in full, in the bad state of the world, the country can repay only 40. The good and the bad state occur with equal probability.

  - (a) Calculate the repayments the creditors are expecting to receive.
  - (b) Find the secondary market price of one unit of debt.

Now assume that the country wants to restructure its debt. It announces that it will introduce two new securities, of type A and B, respectively, to replace the 100 old securities outstanding by means of a debt swap. It issues 40 units of securities of type A, which will pay in the good and the bad state, and 60 units of securities of type B. Securities of type B pay only in the good state of the world. Both new securities are senior to the old existing debt.

- (c) At what rate can the government swap old securities for new securities of type A.
- (d) At what rate can the government swap old securities for new securities of type B.
- (e) What is the net effect of this debt restructuring on the expected repayments to creditors.