

## Corporate Finance - Yossi Spiegel

### Problem set 3

#### Problem 1

This question is based on the paper “A Theory of Workouts and the Effects of Reorganization Law” by Robert Gertner and David Scharfstein (*Journal of Finance*, 1991, 46(4), pp. 1189-222). To answer the question you should read the paper.

- (a) Consider the situation described in Subsection I.C of the paper (p. 1197-1199): the firm makes the following offer to its bank: the bank will forgive the old debt,  $B$ , and instead will give the firm in period 1 the amount  $I+qD-Y$  if this amount is positive (to ensure that the firm is solvent and can invest) or the bank will receive the amount  $Y-I-qD$  if  $I+qD-Y < 0$  (in that case, the bank forgives only  $B-(Y-I-qD)$  in period 1). In addition, the bank will get a new senior debt due in period 2; the face value of this senior debt is so high that the firm always defaults in period 2 and the bank gets the entire period 2 cash flow. Derive in detail the conditions that ensure that the bank will accept the firm’s offer under the following three alternative scenarios (i) the bank’s debt is pari passu with the public debt in period 1, (ii) the bank’s debt is senior to the public debt in period 1, and (iii) the bank’s debt is junior to the public debt in period 1. Note: your derivation should be analogous to the derivation that appears in the paper on p. 1194 for the case of bank debt restructuring without seniority in period 2. Also note that in cases (i) and (ii) you should ultimately obtain conditions (5) and (6) in the paper – what I ask you is to derive these conditions similarly to what is done in equations (1) and (3) in the paper.
- (b) How does the bank’s seniority in period 1 affect the firm’s incentive to invest? Explain the intuition for your answer in detail.
- (c) Repeat your answer to (a) and (b) under the assumption that the firm issues new senior public debt (instead of bank debt) with such a high face value that the firm always defaults in period 2 and the new senior debt gets the entire period 2 cash flow. To ensure that it is solvent in period 1, the firm must raise from the new debtholders the amount  $I+qD+B-Y$ . Derive in detail the condition that ensures that the firm can issue such a senior public debt. Does the seniority of the existing bank’s debt matter in this case? Explain your answer in detail.
- (d) Compare your answer to (b): how would new senior debt affect the firm’s incentive to invest in comparison with senior bank’s debt? What is the intuition for your answer?

Problem 2

Consider the Dewatripont and Maskin (1995) paper we studied in class. Suppose that if the first creditor agrees to refinance a bad project in period 1, then expends a monitoring effort,  $a \in [0, 1]$ , such that the bad project succeeds with probability  $a$  and yields a return  $R$ , and with probability  $1-a$  the bad project fails and yields no return. The first creditor's cost of effort is  $\psi(a) = 2a^2$ .

- (a) Compute the range of values of  $R$  for which we have a soft budget constraint (SBC) problem when the first creditor is "large."
- (b) Now suppose that the first creditor is small so the funds for refinancing must come from a second creditor. Show the maximization problem of the first creditor assuming that he has all the bargaining power vis-à-vis the second creditor, and compute the first order condition for this problem.
- (c) What is the value of  $a$  in equilibrium? (Hint: notice that since  $a \in [0, 1]$ , then when  $R$  is "small," there will be no equilibrium with positive values of  $a$ . Hence, in your answer you must distinguish between different levels of  $R$ ).
- (d) What is the range of values of  $R$  for which we have a SBC problem when the first creditor is "small"?
- (e) Given your answers to (a) and (d), what is the range of values of  $R$  for which "small" creditors solve the SBC problem?