

Practice Question #4

Course 14.454 – Macro IV, Fall 2004

Financial Constraints and the Labor Market

We now introduce a labor market into the CSV model you solved in problem set #2. (You need to use the same setup given in that question to solve this practice question). The labor market is competitive, with a given upward-sloping labor supply curve. Each project now also requires one worker to operate and returns a profit $\pi = x - y$, where y is the equilibrium wage and x is the project's productivity (again distributed uniformly over the interval $[0, 2\bar{x}]$). The labor market clears and wages are paid *before* project productivities are realized. Also, now assume that all entrepreneurs are endowed with the same amount of wealth, w .

- (a) Again, assume the entrepreneur is willing to undertake the project, and analyze the project from the point of view of the outside investor.
 - i. Find the investor's expected gain if she invests in the project.
 - ii. Write out the expression that determines the D^* that will be chosen.
 - iii. What are the expected verification costs for the investor? How and why does a positive wage affect the expected verification costs?
 - iv. Taking D^* as given, write down the condition in which the entrepreneur is willing to undertake the project. Use the equilibrium condition for D^* to write this condition in terms of the wage, the project's expected return, the outside return \bar{R} , and the expected verification costs of the investor.
- (b) Compare your answer in part (a) to your answers for question 1 in the second problem set. How does the inclusion of a labor market affect the number of projects that will be undertaken?
- (c) For simplicity, assume there is a continuum 1 of entrepreneurs. Explain how the labor demand curve can be derived. What is the effect of financial constraints on wages and employment? [*Hint: To see the effect of the financial constraints, compare the equilibrium wage and employment level to what they would be under an efficient equilibrium*].