

Practice Question #1

Course 14.454 – Macro IV, Fall 2004

1. A Model of Dual Labor Markets (based on Shapiro and Stiglitz)

Assume that there are two types of jobs. In type-1 jobs, workers face a cost for their efforts, and the firm catches a worker shirking with probability p . Workers in type-2 jobs produce y , and there is no cost of effort to working in a type-2 job. The price of output in both sectors is one.

Workers can obtain type-2 jobs immediately at the prevailing wage. Thus, any unemployed person can always choose to work in a type-2 job, should they choose to do so. But, type-1 jobs can only be obtained by unemployed workers, who have the usual Poisson probability (h_1/u) of obtaining a job.

Unemployed workers get benefits b , the cost of effort for type-1 workers is e , and the probability of exogenous separation from employment is s (but note that this will only apply to type-1 jobs, since workers in type-2 jobs can get another job immediately). Assume there is a continuum 1 supply of labor, and let L_1 denote the number of workers in sector 1 and L_2 as the number of workers in sector 2.

- (a) Discuss a couple of differences in this model to that of the one presented in class. How do you think these might affect the equilibrium?
- (b) Interpret the probability (h_1/u) of being hired? What does h_1 and u stand for? What are the steady state levels of h_1 and u in terms of s , L_1 , and L_2 ?
- (c) Solve for the wage in each sector. [Hint: You will need to solve using equations for V_1^N , the value of being in sector 1 and not shirking; V_1^S , the value of shirking in sector 1; V_2 , the value of working in sector 2; and V_U , the value of being unemployed.]
- (d) Given the probability (h_1/u) , which sector has a higher wage? Does this make sense? Does the effect of each parameter in the equations for each wage make sense?
- (e) Assume that there is only one firm in sector 1, but it behaves perfectly competitively (It makes zero profits and takes prices and wages as given). The firm's production function is $F(L_1)$, where $F'(L_1) > 0$ and $F''(L_1) < 0$. There is free entry of firms into sector 2. Show how to obtain two equations that can be used to solve for the equilibrium values for L_1 and L_2 ; however, you do not need to solve them.)
- (f) What kind of markets might this model be intended to reflect? Do you think it is a good model of duality in the labor markets? What modifications might improve it?