

PROBLEM SET #5

1. Consider the problem faced by an unemployed worker searching for a job. Every period that the worker searches, she receives a job offer with the wage w drawn independently from the time invariant probability distribution $F(v) = \text{prob}(w \leq v)$, $v \in [0, B]$, $B > 0$. After receiving the wage offer w the worker faces the choice (1) to accept it or (2) to reject it, receive unemployment benefit b , and search again next period. That is,

$$y_t = \begin{cases} w & \text{if job offer has been accepted} \\ b & \text{if searching} \end{cases}.$$

The worker solves

$$\max E \sum_{t=0}^{\infty} \beta^t y_t$$

where $1 > \beta > 0$. Once a job offer has been accepted, there are no fires or quits.

- a) Formulate the worker's problem as a dynamic programming problem by writing down Bellman's equation.
- b) Using Bellman's equation from part a, characterize the value function $V(w)$ in a graph and argue that the worker's problem reduces to determining a reservation wage \bar{w} such that she accepts any wage offer $w \geq \bar{w}$ and rejects any wage offer $w < \bar{w}$.
- c) Consider two economies with different unemployment benefits b_1 and b_2 but otherwise identical. Let \bar{w}_1 and \bar{w}_2 be the reservation wages in these two economies. Suppose that $b_2 > b_1$. Prove that $\bar{w}_2 > \bar{w}_1$. Provide some intuition for this result.
- d) Consider two economies with different wage distributions F_1 and F_2 but otherwise identical. Let \bar{w}_1 and \bar{w}_2 be the reservation wages in these two economies. Define a mean preserving spread. Suppose that F_2 is a mean preserving spread of F_1 . Prove that $\bar{w}_2 > \bar{w}_1$. Provide some intuition for this result. Explain why expected utility is higher in the economy with wage distribution F_2 than it is in the economy with wage distribution F_1 .