

## Problem Set 8: Search and Matching

Econ720. Fall 2013. Prof. Lutz Hendricks. August 18, 2013

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### 1 Business Cycles and Search

Consider the following version of a McCall model.

Time is discrete:  $t = 0, 1, 2, \dots$ . There is a continuum of workers that are either employed or unemployed. Each worker dies with probability  $\mu$  in each period.

An employed worker enters the period with the current wage offer  $w$ . She can choose to remain employed at that wage or to draw a new offer from a distribution  $F(w)$  with support  $[0, M]$ . If she chooses to draw a new offer, her previous job is lost and she becomes unemployed. Then she earns benefits  $b$  in the current period and enters the next period as an unemployed worker with offer  $w'$  in hand.

An unemployed worker faces essentially the same problem. She can also choose to work at last period's offered wage, or she can draw a new offer. If she draws a new offer, the previous one is lost and she receives benefits  $b$  in the current period.

Each worker seeks to maximize  $E \sum_{t=0}^{\infty} (1 - \mu)^t \beta^t c_t$  where  $c_t$  equals the worker's income.

#### Questions:

1. Characterize the decision rule of an employed / unemployed worker. Hint: How do the two differ?
2. How does  $\mu$  affect the decision rule of an unemployed worker? What is the intuition?
3. Now consider an environment where the wage fluctuates in an i.i.d. fashion between high and low values (booms and recessions). To implement this easily, assume that the worker is paid  $w + z_s$  where the wage is drawn from  $F(w)$  as before and  $z_s$  is high in a boom ( $s = B$ ) and low in a recession ( $s = R$ ). Show that the reservation wage is lower in a boom than in a recession. So the model can generate voluntary quits.