# Quiz on Labor Demand

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**Question 1**

Consider a matching model of unemployment with labor force of size $H$, a recruiting cost of $r > 0$ recruiters per vacancy, a job-separation rate $s > 0$, and a Cobb-Douglas matching function: $m = \sqrt{U} \times \sqrt{V}$. Define the labor market tightness as $\theta = V/U$. Using the assumption that labor-market flows are balanced, compute the recruiter-producer ratio $\tau = R/N$.

A. $\tau(\theta) = \frac{\sqrt{\theta}}{1 - r \times s \times \sqrt{\theta}}$

B. $\tau(\theta) = \frac{r \times s}{1 - r \times s \times \sqrt{\theta}}$

C. $\tau(\theta) = \frac{r \times s \times \sqrt{\theta}}{1 - r \times s \times \sqrt{\theta}}$

D. $\tau(\theta) = \frac{r + s}{r + s \times \sqrt{\theta}}$

E. $\tau(\theta) = \frac{r \times s \times \sqrt{\theta}}{r \times s \times \sqrt{\theta} - 1}$

F. None of the above

**Question 2**

The recruiter-producer ratio derived above has the following properties:

A. It is increasing in $\theta$ and positive on $\mathbb{R}_+$, with $\lim_{\theta \to \infty} \tau(\theta) = \infty$.

B. It is decreasing in $\theta$ and positive on $\mathbb{R}_+$, with $\lim_{\theta \to \infty} \tau(\theta) = 0$.

C. It is increasing in $\theta$ and positive on $[0, rs]$, with $\lim_{\theta \to rs} \tau(\theta) = \infty$.

D. It is increasing in $\theta$ and positive on $[0, 1/rs]$, with $\lim_{\theta \to 1/rs} \tau(\theta) = \infty$.

E. It is decreasing in $\theta$ and positive on $[0, rs]$, with $\lim_{\theta \to rs} \tau(\theta) = 0$.

F. None of the above.

**Question 3**

Consider a matching model of unemployment with labor force $H$, a recruiting cost of $r > 0$ recruiters per vacancy, a job-separation rate $s > 0$, a Cobb-Douglas matching function $m = \sqrt{U} \times \sqrt{V}$, a fixed wage $w$, and a production function $y = 2 \times a \times \sqrt{N}$, where $a$ governs labor productivity and $N$ denotes the number of producers in the firm. Define labor market tightness as $\theta = V/U$. What is the labor demand?

A. $L^d(\theta) = (1 - rs\sqrt{\theta})^2 \times (a/w)^2$

B. $L^d(\theta) = \frac{(w/a)^2}{(1-rs\sqrt{\theta})^2}$

C. $L^d(\theta) = \frac{(a/w)^2}{1-rs\sqrt{\theta}}$

D. $L^d(\theta) = (1 - rs\sqrt{\theta}) \times (a/w)^2$

E. $L^d(\theta) = (1 - rs\sqrt{\theta}) \times (a/w)$

F. None of the above

**Question 4**

The labor demand curve derived in the previous question has the following properties:

A. It is decreasing in $\theta$, with $L^d(0) = (a/w)^2$ and $L^d(1/(rs)^2) = 0$.

B. It is decreasing in $\theta$, with $L^d(0) = \infty$ and $L^d(\infty) = 0$.

C. It is increasing in $\theta$, with $L^d(0) = 0$ and $L^d(1/(rs)^2) = (a/w)^2$.

D. It is decreasing in $\theta$, with $L^d(0) = (a/w)$ and $L^d(1/(rs)) = 0$.

E. None of the above.

**Question 5**

Consider a matching model with a fixed wage. An increase in the wage leads to:

A. An inward shift of the labor supply curve.

B. An outward shift of the labor supply curve.

C. A downward shift of the labor demand curve.

D. An upward shift of the labor demand curve.

E. A downward rotation of the labor demand curve.

F. An upward rotation of the labor demand curve.

G. None of the above.