Labor Demand and Labor Supply Curves

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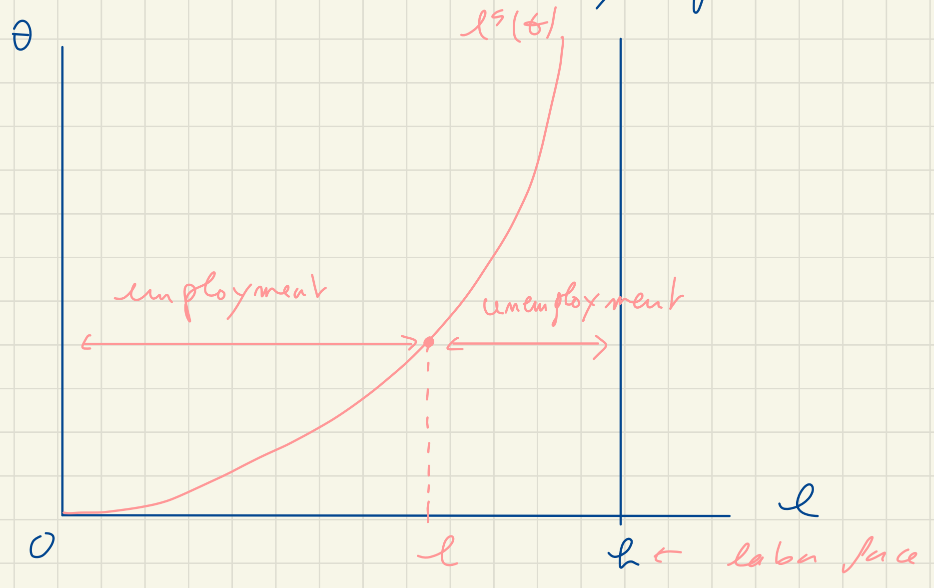
Labor supply: # workers who find a job given labor-force participation & matching process.

$$\boxed{l^s(\theta) = \hat{f}(\theta) \cdot h}$$

labor force

job-finding proba

- $l^s(0) = 0$ b/c $\hat{f}(0) = 0$
- $\lim_{\theta \to \infty} l^s(\theta) = h$ b/c $\lim_{\theta \to \infty} \hat{f}(\theta) = 1$
- l^s is $\nearrow$ in θ b/c $\hat{f}$ is $\nearrow$ in θ
- l^s is concave in θ b/c $\hat{f}$ " concave in θ



Labor demand: # workers that firms want to hire for given tightnesses x, θ and prices p, w [to maximize profits]

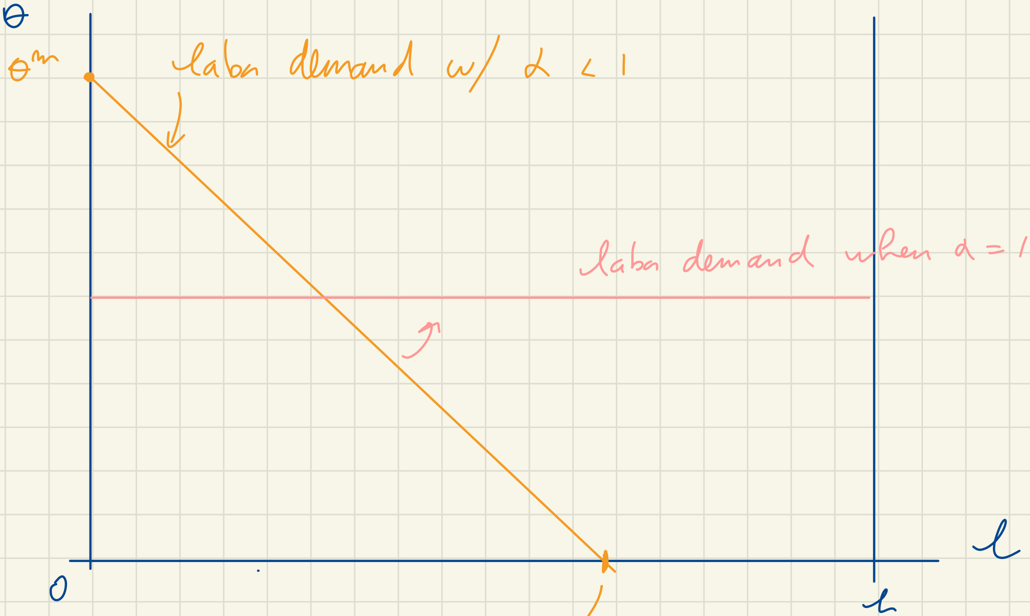
$$\boxed{l^d(x, \theta, p, w) = \left[\frac{f(x)\, a\, \alpha}{w/p}\right]^{1/1-\alpha} \left[\frac{1}{1+\hat{\tau}(\theta)}\right]^{\alpha/1-\alpha}}$$

- $l^d(x=0) = 0$ b/c $f(x=0) = 0$
- $l^d(\theta=\theta^m) = 0$ b/c $\hat{\tau}(\theta=\theta^m) = \infty$
- $x \to \infty$, $f(x) \to 1$
- $\theta \to 0$, $\hat{\tau}(\theta) \to \hat{\rho}/1-\hat{\rho}$, $1+\hat{\tau}(\theta) = 1/1-\hat{\rho}$

$$l^d(\theta=0) = \left[\frac{f(x)\, a\, \alpha}{w/p}\right]^{1/1-\alpha} \left[1-\hat{\rho}\right]^{\alpha/1-\alpha}$$

- l^d is ↗ in x (b/c $f(x)$ ↗ in x)
- l^d is ↘ in θ (b/c $\hat{\tau}(\theta)$ ↗ in θ)
- l^d is ↘ in w/p

Labor-market diagram.



$$\ell^d(\theta = 0) = \left(\frac{f(x)\, a\alpha}{w/p}\right)^{1/1-\alpha} \cdot \left(1-\hat{\rho}\right)^{\alpha/1-\alpha}$$

With linear production function: $\alpha = 1$

Labor demand is

$$\underbrace{(\ell^d)^{1-\alpha}}_{1} = \left(\frac{f(x)\, a\alpha}{w/p}\right) \cdot \left(\frac{1}{1+\hat{\tau}(\theta)}\right)^{\cancel{\alpha}\ 1}$$

Labor demand implies, when $\alpha = 1$

$$1 + \hat{\tau}(\theta) = \frac{f(x)\, a\alpha}{w/p}$$

↳ no employment: degenerate demand

↳ $\theta^d(x, w, p)$ → horizontal labor demand in (θ, ℓ) diagram