

EE320 Quiz 1 Solution

1.1

$$L^d = 12000 - 5w$$

$$L^s = 2000 + 15w$$

$$L^d = L^s$$

$$12000 - 5w = 2000 + 15w$$

$$10000 = 20w$$

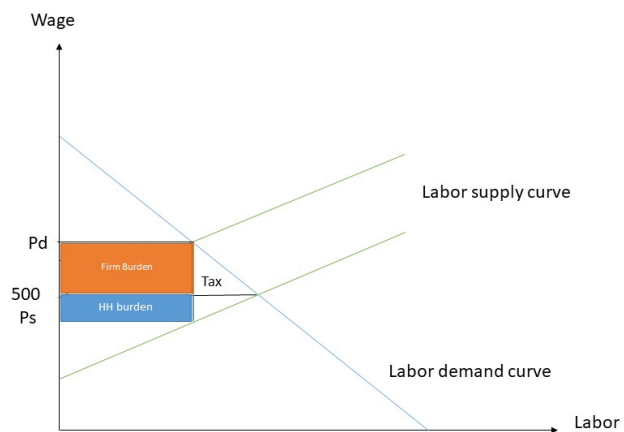
$$w^* = 500$$

$$L^* = 2000 + 15(500) = 9500$$

1.2

The minimum wage is higher than the market equilibrium. Therefore, there will be excess supply of labor. The level of employment will be at $L^d = 12000 - 5(600) = 9000$. Note that the new level of labor supplied is at $L^s = 2000 + 15(600) = 11000$.

1.3



According to the slope of the graphs, the supply for labor is more elastic, therefore firms or demand for labor should suffer more tax burden. Note that, for drawing these graphs, you need to write the equation in term of the inverse demand/supply function (ex. $w^d = [12000 - L^d]/5$).

For mathematics

$$|\text{Elasticity of Supply}| = \left| \frac{dL^s}{dw} * \frac{w}{L} \right| = 15 * \frac{500}{9500}$$

$$|\text{Elasticity of Demand}| = \left| \frac{dL^d}{dw} * \frac{w}{L} \right| = 5 * \frac{500}{9500}$$

As you can see $|E^s|$ is more than $|E^d|$.

2.

2.1

$$P_x^d = 10 - bQ_x^d + cP_y$$

$$P_x^s = 20 + dQ_x^s$$

In order to have an equilibrium the intercept of demand curve must more than the intercept of supply curve. In other words,

$$10 + cP_y > 20$$

$$P_y > \frac{10}{c}$$

2.2

Lets

$$P_x^d = P_x^s$$

$$10 - bQ_x + cP_y = 20 + dQ_x \quad ; Q_x^d = Q_x^s$$

$$cP_y - 10 = bQ_x + dQ_x$$

$$cP_y - 10 = (b + d) * Q_x$$

$$\frac{cP_y - 10}{(b + d)} = Q_x^*$$

Sub Q_x^* into $P_x^s = 20 + dQ_x^s$

$$P_x^* = 20 + d\left(\frac{cP_y - 10}{(b + d)}\right) \quad ; P_x^d = P_x^s = P_x^*$$

2.3

Since $b > 0, c > 0, d > 0$, the term $\frac{c}{(b+d)}$ which is the coefficient of P_y on Q_x^* must be positive. Therefore if P_y increases, the quantity of goods x must also increase, vice versa. As a result, their relationship is substitution.

Extra. FYI

Showing that either tax on consumers or producers will result in the same conclusion of burden, only the elasticity matter.

