

Suppose the short-run demand for labor in a manufacturing plant is estimated to be

$$N = 30 - .6W$$

where  $N$  = number of employees  
 $W$  = wage rate

- 1) What is the point elasticity of demand at a wage rate of \$10?
- 2) Is this demand elastic or inelastic?
- 3) Should a union press to raise the wage rate to \$15 if the union wants to increase the wage bill (i.e.  $N \cdot W$ )? Verify your answer by computing the wage bill at  $W = \$10$  and  $W = \$15$ .

Remember that the own wage elasticity of demand has the formula

$$\frac{\Delta N}{\Delta W} \cdot \frac{W}{N}$$

and that  $\frac{\Delta N}{\Delta W}$  is the change in  $N$  as  $W$  change by 1 unit.

- 4) Long-run labor demand includes other input prices along with the wage. Suppose the estimated long-run labor demand relationship is

$$N = 30 - 1.6W + .2r$$

where  $N$  is the number of employees,  $W$  is the wage, and  $r$  is the price of capital.

- i) Are labor and capital complements or substitutes? How do you know?
- ii) What is the elasticity of demand for labor when the wage rate is \$10 and  $r = .1$ ?  
Hint: set  $r = .1$ , let  $30 + .2r$  be the new constant term and compute as before.  
How does the long-run elasticity compare to the short-run elasticity?  
What happens to the wage bill in the long-run as the wage rises above \$10?