Economics 320
Problem Set 5

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

\[ N = 30 - 0.6W \]

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

\[ N = 30 - 1.6W + 0.2r \]

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 \( r = 0.1 \)?
Hint: set \( r = 0.1 \), let \( 30 + 0.2r \) 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?