The Demand for Labor

• This lecture develops the model of labor demand

• The next lecture develops labor supply

• A third and fourth lecture apply the model to some specific issues.

Why study labor demand and supply?

• Factor markets are important in themselves.

• We are all interested in labor markets.
• We are particularly interested in one aspect, human capital.
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• Factor markets are important in themselves.
• The theory says important things about the markets for particular commodities.
  – We think of many commodities as factors of production.
  – An automobile is not a commodity per se, but a factor of production for transportation services.

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• Firms worry a great deal about this topic.
• Many important political topics turn on an understanding of factor markets.

The Basics of Factor Demand

Production isoquants describe the relation between inputs and outputs

Two Key Propositions

• Labor has a positive marginal product.
• Labor has a diminishing marginal physical product.
The Short Run Demand For Labor

- The VMP curve is the short run labor demand curve.
- When the wage rate is $w_o$, $L_o$ workers are demanded.
- When the wage rate is $w_1$, $L_1$ workers are demanded.

\[ VMP = MPP \times P \]
While we would normally expect an increase in output to lead to an increased demand for both factors, that need not be the case.

Let’s see what happens when wages change. Initially the firm is employing $L^*$ workers.

Now, the wage rate falls to $w'$. If the firm kept producing the same amount of output, we would substitute labor for capital.

But there is more to the story. What happens to $MC$?
The Effect of a Change in Wage Rate

It probably moves to the right. (Note that this is a fall in MC).

\[ L^* \quad L^{**} \quad L \]
\[ Q^* \quad Q^{**} \]

The Two Effects

*Substitution Effect + Scale Effect*

\[ \text{Change in Quantity of Labor Demanded} = \text{Substitution Effect} + \text{Scale Effect} \]

*In general, we expect the substitution effect will dominate even if the scale effect is negative.*

From Firm Demand to Market Demand

\[ w \quad Q \]
\[ w_o \]
\[ q_1 \quad q_2 \quad q_m = q_1 + q_2 \]
Applications

• Short Run Labor Demand
  – A change in wage rates
  – A change in the price of the product

• Long Run Labor Demand

A Change in the Wage Rate - Short Run Labor Demand

• When the wage rate is \( w_0 \), \( L_0 \) workers are demanded.

\[ VMP = MPP \times P \]

A Change in the Wage Rate - Short Run Labor Demand

• When the wage rate is \( w_0 \), \( L_0 \) workers are demanded.

• When the wage rate is \( w_1 \), \( L_1 \) workers are demanded.
A Change in the Wage Rate-Short Run Labor Demand

- When the wage rate is \( w_0 \), \( L_0 \) workers are demanded.
- When the wage rate is \( w_1 \), \( L_1 \) workers are demanded.
- In short, the lower the wage rate the greater the quantity of labor demanded.

\[ L_{VMP} = MPP \times P \]

A Change in the Product Price-Short Run Labor Demand

- When the wage rate is \( w_1 \), \( L_1 \) workers are demanded.

\[ L_{VMP} = MPP \times P \]

A Change in the Product Price-Short Run Labor Demand

- When the wage rate is \( w_1 \), \( L_1 \) workers are demanded.
- If the price rises to \( P^* \), the VMP curve shifts up and to the right.

\[ L_{VMP} = MPP \times P^* \]

A Change in the Wage Rate-Long Run Labor Demand

\[ \text{Change in Quantity of Labor Demanded} = \text{Substitution Effect} + \text{Scale Effect} \]

- A fall in the wage rate means increased quantity demand via the substitution effect.
A change in the Wage Rate-Long Run Labor Demand

Change in Quantity of Labor Demanded

= Substitution Effect + Scale Effect

- A fall in the wage rate means increased quantity demand via the substitution effect.
- While theoretically possible that the scale effect could reverse this, it is not likely.

A Change in the Product Price-Long Run Labor Demand

\[ \text{MC} \]

- There is no substitution effect, but the scale effect is probably positive, so that the higher price probably leads to an increased demand.