Lecture 21 – The Markets for Factors of Production

I. Labor Market
A. Overview

B. Demand for Labor

We now want to look at the determinants of the Labor Demand curve. The general idea is that profit maximizing firms will not pay more than value marginal product of labor and will be forced to pay the value marginal product if there is competition among firms.

Consider capital and other inputs to be fixed in the short-run. The firm maximizes profits by hiring labor as long as the cost of hiring one additional laborer is less than the benefit.

Production Function (with capital fixed)-- Relationship between total product and amount of labor at a fixed amount of the capital stock.
Now, how does the firm decide how much labor to hire? The firm is interested in profits and, therefore, wants to convert this into money. The value of the product is just output time price. The value of the marginal product, or value marginal product, is just the marginal product times the price. The value marginal product is the amount of revenue that the firm receives from hiring one additional unit of labor.

The cost of hiring an additional unit of labor is just the wage rate, which is determined by the market, and exogenous to the decision of each firm in a competitive market. Given the wage, the firm will hire workers as long as the revenue received, or the value marginal product, is greater than the cost of hiring the additional worker. This will occur as long as the VMP curve is above the wage. Once the VMP is less than the wage, the firm is losing money by hiring the additional worker. Therefore, the firm will hire until the point where VMP equals the wage.

**Value Marginal Product** = Marginal Product * Price of Output
We can now see the firms short run demand for labor curve, or the relationship between the wage and the quantity of labor demanded. We want to ask how much labor will be demanded by this firm at each level of the wage. It is the Value Marginal Product Curve.

What causes the Value Marginal Product to shift?

1. **Change in the Output Price**  
   When the price of output changes, the value marginal product (MP * price of output) changes.

2. **Technological Change**  
   Marginal product of labor (holding other inputs such as capital fixed) changes when the technology changes.
3. Change in use of Other Factors (such as capital) – An change in the use of another factor, such as capital, changes the relationship between labor and output, since the value marginal product curve is drawn for a fixed amount of all other factors.
III. The Supply of Labor

**Key idea 1**  
In order to work one hour (and earn a wage), an hour must be given up from other activities. For now, consider all of those other activities to be leisure (even though many of them, such as taking care of kids, etc, are not really leisure)

**Key idea 2**  
Since people like leisure, there is a trade-off between working and enjoying leisure. For the wages of most people, when the wage goes up, people want to increase the number of hours worked. For some people, once the wage gets high enough, that person would prefer to enjoy leisure rather than earn extra money (since they already are earning enough).

When the number of hours supplied to the labor market increases when the wage increases, the labor supply curve is upward-sloping. When the number of hours supplied to the labor market decreases when the wage increases (at high levels of the wage), the labor supply curve is backward-bending.
What causes labor supply to shift?

1. Changes in Tastes
2. Changes in Alternative Opportunities
3. Immigration

IV. Equilibrium in the Labor Market

Exercise 1 -- What happens to the equilibrium wage and equilibrium employment when there is immigration?

Exercise 2 – What happens to the equilibrium wage and equilibrium employment when the price of capital (rental price) falls?

Exercise 3 – What happens to the equilibrium wage and equilibrium employment when preferences change favoring leisure over the consumption of other goods?

Exercise 4 – What happens to the equilibrium wage and employment when technology improves (across the economy)?
V. The Markets for Other Factors of Production

Capital Goods

Land

Supply of Land

Demand for Land