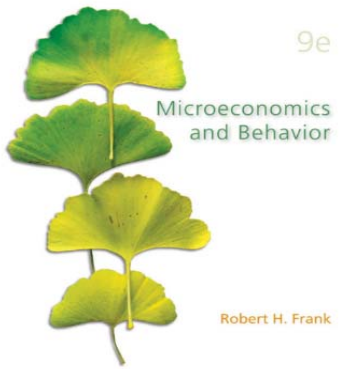
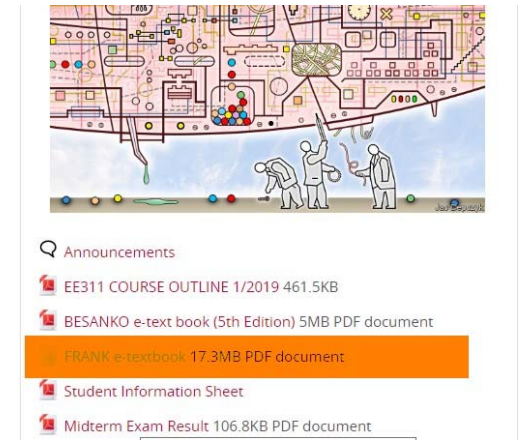
EE311:
Factor Markets (Part 1)

Reading





Frank, Robert H. *Microeconomics and Behavior,* (9th ed.), New York: McGraw-Hill, 2015

Overview of Factor Markets

Firms that we have studied so far operate in **Commodity (goods and services) Markets, where commodities are traded.**

But for the firms to supply their products, they need factors of production, e.g. labor, capital, and raw materials.

These **factors of production are traded in Factor Markets.**

Thus, the demand in the factor markets will depend on the demand in the commodity markets: "Derived Demand".

We are particularly interested in the labor market, as labor is used in virtually all production.

Overview of Factor Markets

Overview of Factor Markets

Players in Commodity Markets
- **Buyers: Consumers**
- **Sellers: Firms**

If there is a lot of firms supplying the product,
Then we have a **competitive commodity market**.

If there is one firm supplying the product,
Then we have a **monopolistic commodity market**.

Overview of Factor Markets

Players in Factor Markets (e.g. labor market)
- **Buyers: Firms**
- **Sellers: Owners of Factors (Workers)**

If there is a lot of firms supplying the factor production,
Then we have a **competitive factor market**.

If there is one firm supplying the factor of production,
Then we have a **monopolistic factor market**.
e.g. strong labor union, controlling how many workers to work.

If there is **one firm buying** the factor of production,
Then we have a "**MONOPSONISTIC**" factor market.
e.g. one company in a small town, hiring workers.

Outline

The factor market that we will study is the **LABOR MARKET**.

We will start with the demand for labor and hiring rule
- when the commodity market is competitive.
- when the commodity market is monopolistic.

Then we will look at the supply of labor.
- e.g. how workers supply their labor.

Lastly, we will study the model of **Monopsonist**.
- e.g. when there is only one company hiring workers.

Demand for Labor

How many workers should a firm hire in the short run?

Note that capital (K) is fixed in the short run.

Profit of the firm = $TR - TC = P(Q) \cdot Q - wL - rK$

where $Q = F(K,L)$

Consider two cases:
1) Competitive product market
2) Monopolistic product market

Demand for Labor

How many workers should a firm hire in the short run?

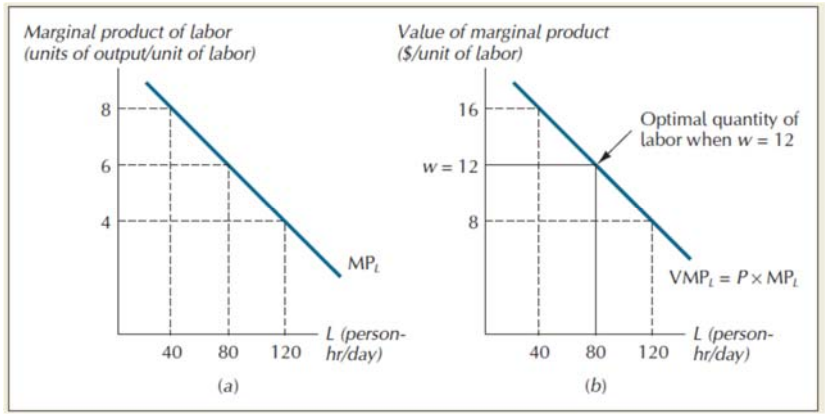
In competitive product market, firms are price-takers.

P(Q) = P Profit of the firm = $P \cdot F(K,L) - wL - rK$

The firm chooses L to maximize the profit by setting $\frac{\partial \pi}{\partial L} = 0$.
This gives $P \cdot MP_L = w$.

Where $P \cdot MP_L$ *is V*alue of Marginal Product of Labor or VMP_L.

Example



At a wage rate of $12/unit of labor, how many units of labor would the firm shown in Figure 14.1 hire if its product sold not for $2/unit but for $3/unit?

Demand for Labor

How many workers should a firm hire in the short run?

In monopolistic product market, the monopolist sets price.
- It faces a downward-sloping demand curve, P(Q).
- If it charges high P, its Q will fall.

Profit of the firm = $P(Q) \cdot F(K,L) - wL - rK$

The firm chooses L to maximize the profit by setting $\frac{\partial \pi}{\partial L} = 0$.
This gives $(P + Q\frac{\partial P}{\partial Q}) \cdot MP_L = MR \cdot MP_L = w$.

Where $MR \cdot MP_L$ is Marginal Revenue Product of Labor or MRP_L.

Demand for Labor

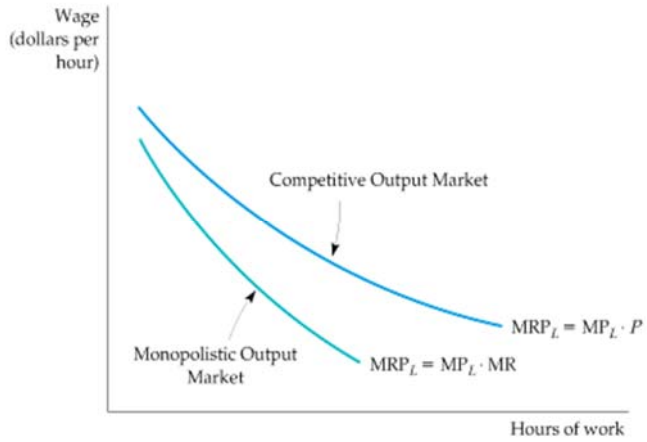
How many workers should a firm hire in the short run?

In competitive product market, firms should hire workers at the point where $\boldsymbol{VMP_L = P \cdot MP_L = w}$
In monopolistic product market, the firm should hire workers at the point where $\boldsymbol{MRP_L = MR \cdot MP_L = w}$

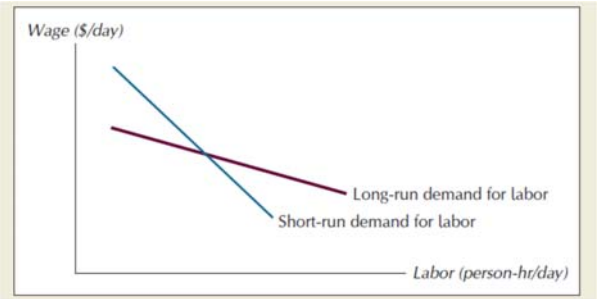
Recall that we derive the two conditions above from profit maximization, so they are actually the same as $\boldsymbol{MR = MC}$.

That is, the extra revenue from hiring one more worker equals the extra cost of hiring that worker.

Demand for Labor



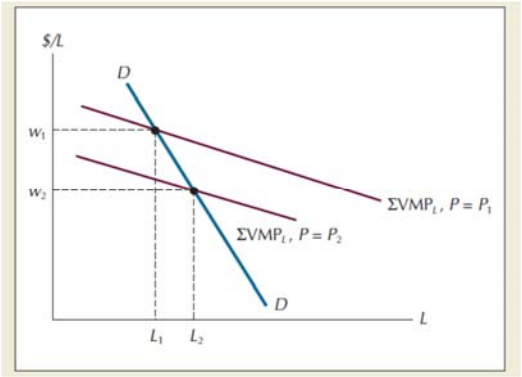
Demand for Labor



The demand for labor is more elastic in the long run because the firm can substitute labor for capital.

The firm's demand for labor will also tend to be more elastic the more elastic the demand is for its product. If a price reduction stimulates a large increase in the quantity of the product demanded, it will also stimulate a large increase in the amount of labor required to produce it.

Demand for Labor



The Market Demand Curve for Labor

When the wage rate falls from w1 to w2, **each firm hires more labor and produces more output**.

The increase in output causes output price to fall, which reduces the value of labor's marginal product. The market demand curve for labor is thus more steep than the horizontal summation of the individual demand curves.

Supply of Labor

- All workers face labor-leisure trade-off.
- They have 24 hours a day, which are allocated between working and resting.

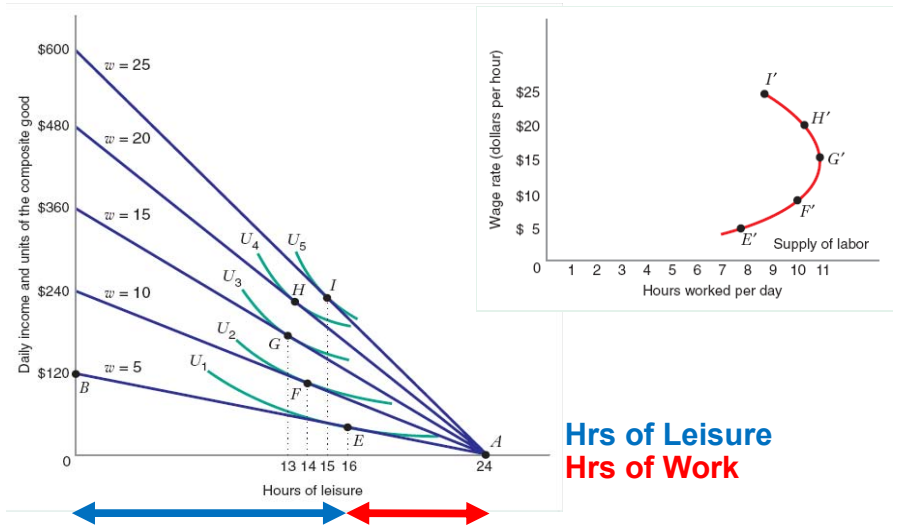
- Workers value both income from working and their leisure time.
- MU for both are positive but diminishing.

Key Concepts

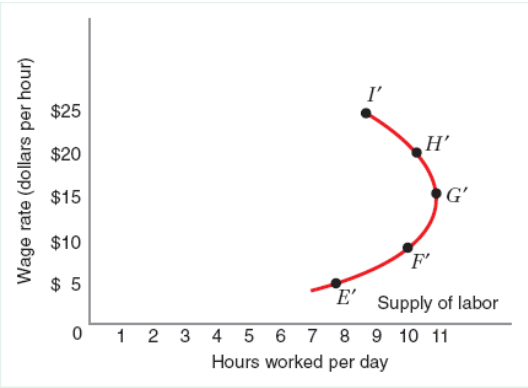
- **One can think of "wage" as "price of leisure"** since when we rest, we forego wage income.
- Leisure is a normal good: as income rise, people want to consume more leisure.

- Now, if wage rises, leisure becomes relatively more expensive. A worker substitutes away from leisure and works more. (Substitution Effect)
- Given a higher wage, workers now become richer. Since leisure is a normal good, more leisure is consumed, and a worker works less
- Two effects work in the opposite directions.

Labor Supply Curve



Labor Supply Curve



The labor supply curve slopes upward over the region where the S.E. of the wage increase outweighs the I.E.

The labor supply curve bends backward over the region where the IE outweighs the S.E.

Market Supply of Labor

The market supply curve of labor is obtained by horizontally adding the individual supply curves of labor.

Even though many individuals may have backward-bending supply curves, the supply curve for any particular category of labor is almost certain to be upward-sloping.

The reason is that wage increases in one category of labor not only change the number of hours worked by people already in that category, but also lure people into that category from other categories. For example, an increase in the price of soybeans causes many cotton farmers to switch to soybeans.

Market Supply of Labor