Market for Factors of Production

ECO 120: Global Macroeconomics

1

1.1 Goals

Goals

- Specific goals:
  - Understand how quantities of factors of production are determined.
  - Understand how prices of factors of production are determined.
  - Understand what determines factor income.
  - Focus on labor and capital.
- Learning objectives:
  - LO2: Apply the supply and demand model to predict quantity and price outcomes of a number of different markets, including markets for currencies, labor, and loanable funds.
  - *Ultimate goal*: use this knowledge to evaluate the impact of macroeconomic policies on the long-run growth rate of an open economy (LO6).

1.2 Relevant Reading

Relevant Reading

- Labor markets: Hubbard and O'Brien, pages 500-510 - Available on D2L.
- Investment/Saving market: Module 29, pages 277-282.

2 Factor Market Basics

2.1 Income From Factors of Production

Factors of Production

- Factor income is income earned from owning and selling factors of production:

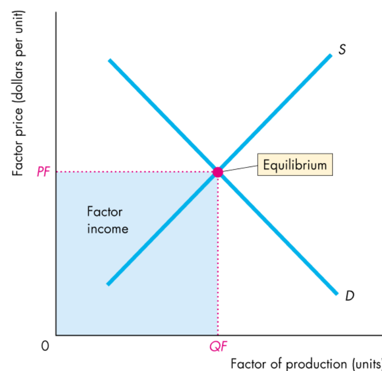
  - Wages earned from working in labor market.
  - Interest earned by renting capital.
  - Rent earned by owning land.

- Price (wages, interest, or rent) and quantities of factors of production are determined by supply and demand.

2.2 Supply and Demand

Supply and Demand

- Demand for factors of production is **derived demand**: demand depends on the demand for the goods being produced with the factors of production.
- Supply for factors of production is determined *households*.
- Income is determined by equilibrium supply and demand.



2.3 Marginals

Measuring Revenue and Production

- **Total Product**: total level of production of the final good.
- **Marginal Product (MP)**: additional level of production attained when hiring *one additional unit* of labor/capital/land.
- **Total Revenue**: total amount of revenue earned on selling the final good.
- **Marginal Revenue (MR)**: additional revenue earned by producing one additional unit of the final good.
- **Marginal Revenue Product (MRP)**: the additional revenue earned by hiring one additional unit of a factor of production.
  - MRP = MP*MR

Diminishing Marginal Product

- **Law of Diminishing Marginal Product** a.k.a. **Law of Diminishing Returns**: the marginal product decreases as you hire additional units of a factor of production.
- What is the shape of the marginal product curve?
- Shape of marginal revenue curve: depending on the type of market, as output increases marginal revenue may decrease or may stay the same (but it does not increase).
- What is the shape of the marginal revenue product curve?

3 Labor

3.1 Example

Example

Suppose a company's production schedule is as given below. Suppose also the company has a constant price for its product at $3 per item.

Labor	Quantity
0	0
2	16
4	28
6	36
8	40

Compute the total revenue, marginal revenue, marginal product, and marginal revenue product for each given level of production.

3.2 Labor Demand

Choosing Labor Demand

- If $MRP > wage$, would you be interested in hiring more or less labor?
  - If you did this, what would happen to MRP?
- If $MRP < wage$, would you be interested in hiring more or less labor?
  - If you did this, what would happen to MRP?
- Profit maximizing choice for labor demand: $MRP = wage$.
- Since the MRP curve tells us labor demand for each wage, *it is the labor demand curve.*

Determinants of Demand

- When something *besides the price of the factor of production* affects the marginal revenue product, the demand for a factor of production changes.
- Changes in the demand for the final good (changes MR).
- Changes in the quantities of other factors of production can change the MP.
  - An increase in capital makes labor more productive (increase in K increases MP_L).
  - An increase in employment makes capital more productive (increase in L increases MP_K).
- Changes in technology.

3.3 Labor Supply

Labor Supply

- This of all your time as either leisure or labor.
- Leisure is a normal good.
  - What is the income effect for leisure, and therefore labor supply?
- What is the price (or opportunity cost) of leisure?
  - What is the substitution effect on leisure, and therefore labor supply, when the price of leisure increases?
- What will be the overall effect of the wage on labor supply? Will labor supply be upward sloping or downward sloping?

3.4 Labor Market Equilibrium

Labor Market Equilibrium

What is the impact on equilibrium wages and employment when...

- There is an improvement in computer technology?
- There is an increase in demand from abroad for U.S. goods?
- There is an increase in the tax rate on labor income?
- A large part of the population (baby boomers) begins to retire?

4 Capital Markets

4.1 Demand

Demand for Investment

- Investment spending today determines the amount of capital in the future.
- Investment typically involves very large expenditures. How do you think investment is funded?
- Demand for investment (future capital) depends on expected *future* marginal product of capital and expected *future* marginal revenue.
- What things can shift demand for capital?
  - ***Anything that affects future*** MP_K ***or future*** MR***.***
  - Changes in technology.
  - Changes in the capital stock caused by war/destruction.
  - Expected future prices, profits.
  - Expected future interest rates.

4.2 Supply

Supply for Capital

- Who supplies capital? How do they do it? Very indirectly, it's households.
- Saving supply curve: How household saving responds to interest rate.
- Factors that shift saving supply:
  - Income.
  - Expected future income.
  - Changes in level of precaution.
  - Changes in wealth.

4.3 Equilibrium

Equilibrium

What will be the impact on the equilibrium interest rate and investment of new capital when...

- A hurricane destroys large amounts of capital stock in the Gulf of Mexico region.
- People's expectations change causing them to distrust the productivity of banks and financial firms' investments.
- There is a decrease in demand for final goods across the economy.
- There is an increase in people's incomes.