Market for Factors of Production

ECO 120: Global Macroeconomics

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:
  - LO 10: Predict how savings, investment decisions, and policies influence capital stock and long-run production possibilities.

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Relevant Reading

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

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.

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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

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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?

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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.

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*.

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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.

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Labor Supply

- Think of all your time as either leisure or labor.
- Think of leisure as a "good" that you purchase. Any leisure not purchased is time you are working.
- What is the price (or opportunity cost) of leisure?
  - What is the substitution effect on leisure when the price of leisure increases?
- Leisure is a normal good.
  - What is the income effect for leisure when the wage increases?
- What will be the overall effect of the wage on labor supply? Will labor supply be upward sloping or downward sloping?

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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?

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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.**
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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.

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Equilibrium

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

- The government runs smaller government budget deficits.
- It is expected that there will be an increase in demand for final goods across the economy.
- There is an increase in average income.
- There is an increase in average income and it is expected to continue to increase in the future.
- A hurricane destroys large amounts of capital stock in the Gulf of Mexico region.

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