CHAPTER 18

The Markets for the Factors of Production

PRINCIPLES OF
Economics
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Premium PowerPoint Slides
by Ron Cronovich

In this chapter, look for the answers to these questions:

- What determines a competitive firm's demand for labor?
- How does labor supply depend on the wage? What other factors affect labor supply?
- How do various events affect the equilibrium wage and employment of labor?
- How are the equilibrium prices and quantities of other inputs determined?

Factors of Production and Factor Markets

- **Factors of production**:
  - Labor
  - Land
  - **Capital**:
- Prices and quantities of these inputs are determined by supply & demand in factor markets.

Derived Demand

- Markets for the factors of production are like markets for goods & services, except:
- Demand for a factor of production is a **derived demand**

Two Assumptions

1. We assume
   - in the market for the product it produces
   - in the labor market
2. We assume
   - Each firm's supply of output and demand for inputs are derived from this goal.

Our Example: Farmer Jack

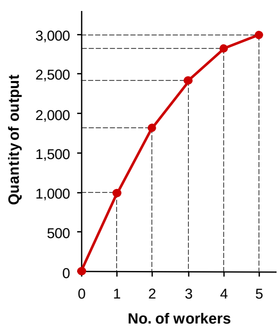
- Farmer Jack sells wheat in a perfectly competitive market.
- He hires workers in a perfectly competitive labor market.
- When deciding how many workers to hire, Farmer Jack maximizes profits by thinking at the margin:
  - If the benefit from hiring another worker exceeds the cost, Jack will hire that worker.

Our Example: Farmer Jack

- Cost of hiring another worker:
- Benefit of hiring another worker:
  Jack can
- The size of this benefit depends on Jack's **production function**: the relationship between the quantity of inputs used to make a good and the quantity of output of that good.

Farmer Jack's Production Function

L (no. of workers)	*Q* (bushels of wheat per week)
0	0
1	1000
2	1800
3	2400
4	2800
5	3000



Marginal Product of Labor (MPL)

- **Marginal product of labor**

The Value of the Marginal Product

- Problem:
  - Cost of hiring another worker
  - Benefit of hiring another worker
- Solution:
- **Value of the marginal product**:

ACTIVE LEARNING ***1***

Computing MPL and VMPL

P = $5/bushel.

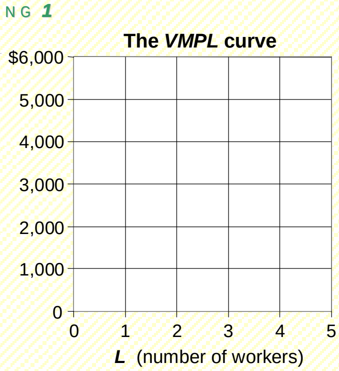
Find ***MPL*** and ***VMPL***, fill them in the blank spaces of the table.

Then graph a curve with ***VMPL*** on the vertical axis, ***L*** on horiz axis.

L (no. of workers)	***Q*** (bushels of wheat)	*MPL*	*VMPL*
0	0		
1	1000		
2	1800		
3	2400		
4	2800		
5	3000		

ACTIVE LEARNING ***1***

Answers

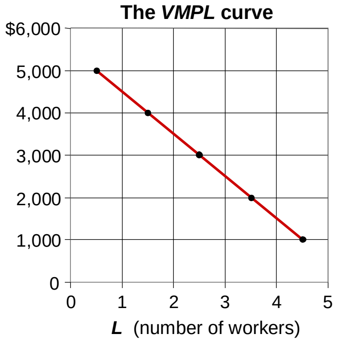


Farmer Jack's Labor Demand

Suppose wage W = \$2500/week.

How many workers should Jack hire?

Answer:

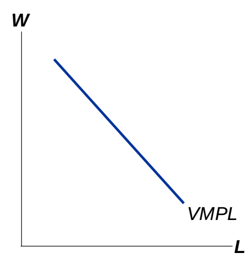


THE MARKETS FOR THE FACTORS OF PRODUCTION 13

VMPL and Labor Demand

For any competitive, profit-maximizing firm:

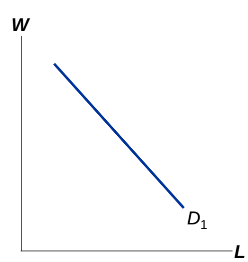
- To maximize profits,



THE MARKETS FOR THE FACTORS OF PRODUCTION 14

Shifts in Labor Demand

Labor demand curve



THE MARKETS FOR THE FACTORS OF PRODUCTION 15

Things that Shift the Labor Demand Curve

-
-
-
- Example:
  If firm gets more equipment (capital), then workers will be more productive; *MPL* and *VMPL* rise, labor demand shifts upward.

The Connection Between Input Demand & Output Supply

- Recall: **Marginal Cost (*MC*)**
  = cost of producing an additional unit of output
  =
- Suppose W = \$2500, *MPL* = 500 bushels
- If Farmer Jack hires another worker,
- In general:

The Connection Between Input Demand & Output Supply

- Notice:
  - To produce additional output,
  - As L rises,
  - causing
  - causing
- Hence,

The Connection Between Input Demand & Output Supply

- The competitive firm's rule for demanding labor:
- Divide both sides by *MPL*:
- Substitute *MC* = *W*/*MPL* from previous slide:
- This is the competitive firm's rule for supplying output.
- Hence,

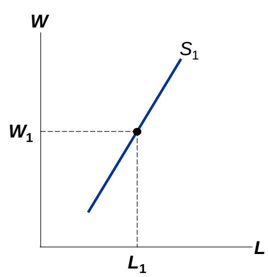
Labor Supply

- Trade-off between
  The more time you spend working,
-

The Labor Supply Curve

An increase in *W* is an increase in

People respond by

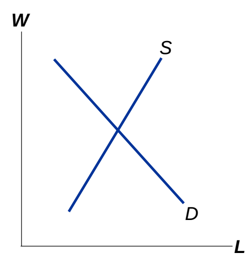


Things that Shift the Labor Supply Curve

Equilibrium in the Labor Market

The wage adjusts to balance supply and demand for labor.

The wage always equals



ACTIVE LEARNING **2**

Changes in labor-market equilibrium

In each of the following scenarios, use a diagram of the market for (domestic) auto workers to find the effects on their wage and employment.

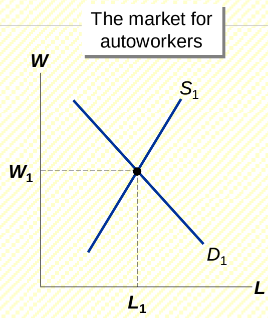
A. Baby Boomers who worked in the auto industry retire.

B. Car buyers' preferences shift toward imported autos.

C. Technological progress boosts productivity in the auto manufacturing industry.

ACTIVE LEARNING **2**

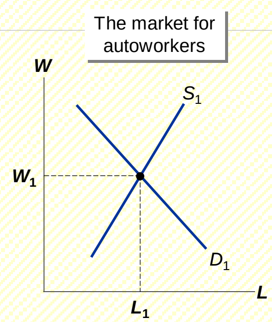
Answers to A



25

ACTIVE LEARNING **2**

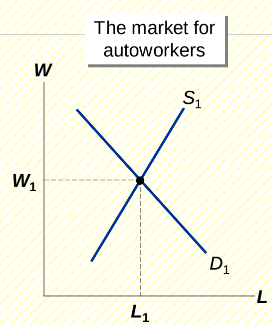
Answers to B



26

ACTIVE LEARNING **2**

Answers to C



27

Productivity and Wage Growth in the U.S.

time period	growth rate of produc-tivity	growth rate of real wages
1959-2006	2.1%	2.0%
1959-1973	2.8	2.8
1973-1995	1.4	1.2
1995-2006	2.6	2.5

Recall one of the Ten Principles:

A country's standard of living depends on its ability to produce g&s.

Our theory implies

We see this in the data.

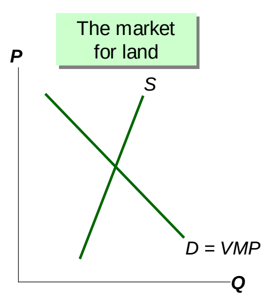
The Other Factors of Production

- With land and capital, must distinguish between:
  - **purchase price**
  - **rental price**
- The wage is
- The determination of the rental prices of capital and land is analogous to the determination of wages…

How the Rental Price of Land Is Determined

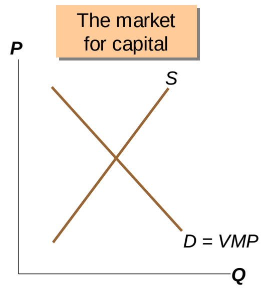
Firms decide how much land to rent by comparing

The rental price of land adjusts to balance supply and demand for land.



How the Rental Price of Capital Is Determined

Firms decide how much capital to rent by comparing



The rental price of capital adjusts to balance supply and demand for capital.

Rental and Purchase Prices

- Buying a unit of capital or land
- The rental income in any period equals the value of the marginal product (*VMP*).
- Hence, the equilibrium purchase price of a factor depends on

Linkages Among the Factors of Production

- In most cases, factors of production are used together in a way that makes each factor's productivity
- Example: an increase in the quantity of capital
  - The marginal product and rental price of capital fall.
  - Having more capital

CONCLUSION

- The theory in this chapter is called the
- It states that
  - factor prices determined by
  - each factor is paid
- Most economists use this theory a starting point for understanding the distribution of income.
- The next two chapters explore this topic further.