CHAPTER 2

Overview of the Labor Market
Chapter Outline

The Labor Market: Definitions, Facts, and Trends

- The Labor Force and Unemployment
- Industries and Occupation: Adapting to Change
- The Earnings of Labor

How the Labor Market Works

- The Demand for Labor
- The Supply of Labor
- The Determination of the Wage

Applications of the Theory

- Who Is Underpaid and Who Is Overpaid?
- Unemployment and Responses to Technological Change Across Countries
2.1 The Labor Market: Definitions, Facts, and Trends

The market that allocates workers to jobs and coordinates employment decision is the labor market, which could be:

- national labor market
- regional
- local
- external
- internal labor market
- primary
- secondary
2.1 The Labor Market: Definitions, Facts, and Trends

The Labor Force and Unemployment

- The Adult Working Population (AWP) consists of those who are over 16 years of age and are in the labor force (LF) and not in labor force (NLF).

\[ AWP = LF + NLF \]

- The labor force consists of those (>16 years of age) who are employed (E) and those who are unemployed (U) but are actively seeking work or waiting to be recalled from layoff.

\[ LF = E + U \]

- People who are not employed and are neither looking for work or waiting to be recalled from layoff are classified as not in labor force (NLF).
2.1 The Labor Market: Definitions, Facts, and Trends

The Labor Force and Unemployment

➢ The labor market is very dynamic – see Figure 2.1
  • Movements/Flows between $LF$ and $NLF$:
    – Those who leave the labor force by retiring or by dropping out.
    – Those who have never worked who are entering the $LF$, while those who have dropped out are reentering the $LF$.
  • Movements/Flows between $E$ and $U$:
    – Employed workers become unemployed by quitting voluntarily or by being laid off – being involuntarily separated from firm either temporarily or permanently.
    – Unemployed workers obtain employment by being newly hired or by being recalled to a job from layoff.
Unemployment rate is the ratio of those unemployed \((U)\) to those in the labor force \((LF)\):

- Varies from year to year, by region, by state, by gender, and by race
- Tends to be low when the labor market is *tight* and high when the labor market is *loose*, which happened in 2009.
2.1 The Labor Market: Definitions, Facts, and Trends

Industries and Occupations: Adapting to Change

➢ The labor-market changes occurring in a dynamic economy are sizable:
  • There are sectoral changes in jobs – some jobs have expanded over the years while some have contracted.
  • Industrial distribution shows:
    – Employment in goods-producing industries (largely manufacturing) has fallen as a share of total nonfarm employment since the 1950s
    – Private-sector services have experienced dramatic growth (expansion in wholesale and retail trade).
  • Workers and employers have adapted to these changes through the acquisitions of new skills and technology.
2.1 The Labor Market: Definitions, Facts, and Trends

The Earnings of Labor

- The price of labor that equilibrate the labor market is the wage rate.

Nominal and Real Wages

- The wage rate is the price of labor per working hour, which could be measured in nominal and/or real terms:
  - **Nominal wage** – what workers get paid per hour in current dollars.
  - **Real wages** or the real purchasing power of a worker’s earnings – nominal wages divided by some measure of prices (usually the consumer price index – CPI).
2.1 The Labor Market: Definitions, Facts, and Trends

The CPI

• Some of the problems with the use CPI as measure of changes in the purchasing power of workers are:
  ▪ Consumer change the bundle of goods and services they buy over time in response to changes in prices but not reflected in the bundle with which the CPI is computed.
  ▪ The quality of goods and services change over time but the CPI does not account for changes in quality.

• Given these and other problems, some economists believe that the CPI has overstated the inflation by as much as 1% point per year.
Wages, Earnings, Compensation, and Income

- **Wages** refer to the payment for a unit of time/hour worked.
- **Earnings** refer to wages multiplied by the number of time units/hours worked.
- **Employee Benefits** can be either *payments in kind* or *deferred*
  - Examples of *payments in kind* are employer-provided health care, health insurance, and paid vacation time.
  - Examples of *deferred payments* are employer-financed retirement benefits – Social Security taxes – set aside money that enables employees to receive pensions later.
- **Total compensation** consists of earnings plus employee benefits.
- **Income** received by a family includes earnings, benefits, and *unearned income*, which included dividends or interest received on investment and government transfer payments.
Figure 2.4  Relationship among Wages, Earnings, Compensation, and Income

Wage Rate (pay per unit of time) × Units of Time Worked = Earnings

+ Employee Benefits (in-kind or deferred payments)

= Total Compensation

+ Unearned Income (interest, dividends, government transfer payments)

= Income
2.2 How the Labor Market Works

- Firms must successfully operate in the labor market, the capital market, and the product market if they are to survive.
- Firms purchase inputs – labor (L) and capital (K) used in the production of goods and services – from the labor market and the capital market, respectively.
- The study of the labor market begins and ends with an analysis of the demand for and the supply of labor.
  - Employers/Firms demand for labor from different labor markets.
  - Employees/Workers supply their labor services.
- Remember that the major labor market outcomes are related to:
  (a) the terms of employment (wages, compensation levels, working conditions) and
  (b) the levels of employment.
Figure 2.5  The Markets in Which Firms Must Operate

- Suppliers of Capital
  - Capital Market

- Workers
  - Labor Market

Firms

Product Market

Consumers

OUTCOMES

Terms of Employment
Levels of Employment

for various occupational, skill, and demographic groups
2.2 How the Labor Market Works

The Demand for Labor

- Firms combine $L$ and $K$ to produce goods and services that are sold in the product market.
- Firms’ total output ($Q$) and their mix of inputs ($L$ and $K$) depend on three forces:
  - Output or product demand ($Q^D$).
  - The amount of $L$ and $K$ acquired at given prices: wages ($W$) for $L$ and rental cost ($r_K$) or price ($p_K$) for $K$.
  - Choice of technology ($T$) available to firms.

**Demand for labor:** 
$$L^D = f(W, Q^D, T)$$

where $L^D =$ labor demand or the desired level of employment by the firm, $W =$ wage rate, $Q^D =$ output or product demand, and $T =$ technology.
If $Q^D$ and $T$ are held constant, then $L^D = g(W)$, see Table 2.3.

Wage Changes

• An increase in wage will lead to:
  ▪ A *scale* or *output effect* – the reduction in the scale of production or output due to the reduction in employment.
  ▪ A *substitution effect* – capital is *substituted* for labor in the production process.

**Table 2.3**

<table>
<thead>
<tr>
<th>Wage Rate ($)</th>
<th>Desired Employment Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.00</td>
<td>250</td>
</tr>
<tr>
<td>4.00</td>
<td>190</td>
</tr>
<tr>
<td>5.00</td>
<td>160</td>
</tr>
<tr>
<td>6.00</td>
<td>130</td>
</tr>
<tr>
<td>7.00</td>
<td>100</td>
</tr>
<tr>
<td>8.00</td>
<td>70</td>
</tr>
</tbody>
</table>
Figure 2.6  Labor Demand Curve (based on data in Table 2.3)

Wage (dollars per hour)

Number of Workers

Demand
2.2 How the Labor Market Works

Changes in Other Forces Affecting Demand

- If the demand for the product \(Q^D\) increases, holding other factors \((L, W, K, r_K\) or \(p_K\), and \(T\)) constant, this will lead to scale or output effect as firms try to maximize profits; thus leading to an increase in labor demand.
  - The labor demand curve shifts to the right at every possible wage level indicated in Table 2.3 – see Figure 2.7.

- If the supply of capital changed and \(r_K\) or \(p_K\) fell by 50%, but other factors remained unchanged, more \(K\) would be used in production process – generates two opposite effects for \(L^D\):
  - If the scale effect dominates, more workers will be required as well, thus \(L^D\) will shift to the right – see Figure 2.8 (a).
  - If the substitution effect dominates as firm adopt more capital-intensive technologies in response to cheaper capital, \(L^D\) will shift to the left – see Figure 2.8 (b).
Figure 2.7  Shift in Demand for Labor Due to Increase in Product Demand
Figure 2.8  Possible Shifts in Demand for Labor Due to Fall in Capital Prices

(a) Scale Effect May Dominate

(b) Substitution Effect May Dominate

Demand after a Fall in Capital Prices

Demand Curve at High Capital Prices

Wage

Number of Workers

Wage

Number of Workers
2.2 How the Labor Market Works

Market, Industry, and Firm Demand

• The demand for labor can be analyzed on three levels
  • Firm level – to analyze the demand for labor by a particular firm, we see how an increase in the wage rate of machinists affects their level of employment by a particular aircraft manufacturer.
  • Industry level – to analyze the effect of this wage increase on the employment of machinists in the entire aircraft industry, we utilize an industry demand curve.
  • Market – to see how the wage increase affects the entire labor market for machinists in all industries in which they are used, we use a market demand curve.

Long Run versus Short run

• In the short run, employers find it difficult to substitute capital for labor (and vice versa); and this is also true for product demand.
• It takes time to fully adjust consumption and production behavior.
2.2 How the Labor Market Works

The Supply of Labor

- The simplifying assumption here is that workers have already decided to work, but they must choose their:
  - Occupation
  - Employer

Market Supply

- If the market wage for legal assistants (or “paralegals”) increases and the salaries and wages in other occupations are held constant, more workers would want to become paralegals:
  - Labor supply of paralegals will be upward-sloping – see Figure 2.9
  - The quantity of labor supply will be positively related to the wage rate, holding other wages constant.

- Other factors such as changes in the wage rate of insurance agents, but the wage rate ($W$) of paralegals is unchanged, the $L^S$ curve of paralegals will shift to the left – see Figure 2.10.
Figure 2.9  Market Supply Curve for Paralegals
Figure 2.10  Shift in Market Supply Curve for Paralegals as Salaries of Insurance Agents Rise

Supply of Paralegals when Salaries of Insurance Agents Are:

Wages for Paralegals

Number of Paralegals

High

Low
2.2 How the Labor Market Works

Supply to Firms

• We assume that the labor market for paralegals is perfectly competitive, and that no firm will offer a wage that is above or below what the market wage indicates – firms are wage takers:
  ▪ Labor supply curves of paralegals to a firm are horizontal – see Figure 2.11.
  ▪ At the on-going wage of $W_0$, employers can hire all the paralegals they need and each employer faces $S_0$ supply curve.
  ▪ If the paralegal wage falls from $W_0$ to $W_1$, employers can still hire as much as they want at the lower wage, and each firm’s or employer’s labor supply curve becomes $S_1$ with the same slope as the supply curve $S_0$.

• Note that a fall in the wage rate of paralegal does not mean withdrawals from the paralegal profession into the insurance agent market because they are not perfect substitutes.
Figure 2.11  Supply of Paralegals to a Firm at Alternative Market Wages

Wages for Paralegals

\[ W_0 \]
\[ W_1 \]

Number of Paralegals

\[ S_0 \]
\[ S_1 \]
2.2 How the Labor Market Works

The Determination of the Wage

The wage rate that prevails in the labor market depends on $L^D$ and $L^S$, regardless of whether labor unions and/or nonmarket factors are involved – see Figure 2.12.

The Market-Clearing Wage

• The wage rate ($W_e$) at which $L^D$ equals $L^S$ is the market-clearing wage – that is, no labor surplus and/or no labor shortage.

• For any wage ($W_1$) lower than $W_e$: $L^D > L^S \rightarrow EDL$, and with adjustments from employers/demanders, wage rises to $W_e$.

• For any wage ($W_2$) higher than $W_e$: $L^D < L^S \rightarrow ESL$, and with adjustments from workers/suppliers, wage falls to $W_e$.

• $W_e$ becomes the going wage that individual employers and employees face – see Figures 2.12 and 2.13.
Figure 2.12  Market Demand and Supply

Wage

\[ W_2 \]

\[ W_e \]

\[ W_1 \]

Number of Workers

Supply

Demand
Figure 2.13  Demand and Supply at the “Market” and “Firm” Levels

(a) Market

(b) A Typical Firm

Wage

Wage

Total Employment

Employment at Firm A

$W_e$

$S_A$

$S$

$D$

$L$

$L_a$
2.2 How the Labor Market Works

Disturbing the Equilibrium

- Changes in labor demand or changes in labor supply or the simultaneous changes in labor demand and supply will change the equilibrium wage \( W_e \) and employment \( L \):
  - If \( L^D \) shifts to the right, \( W_e \) rises to \( W_e^* \) – see Figure 2.14.
  - If \( L^S \) shifts to the left, \( W_e \) rises to \( W_e' \) – see Figure 2.15.

- If the \( L^S \) curve shifts to the right – see Figure 2.16 – or the \( L^D \) curve shifts to the left, market wage will fall from \( W_e \) to \( W_e' \).

- If \( L^S \) shifts to the left and this is accompanied by a rightward shift in \( L^D \), market wage will rise dramatically with net employment increase – see question # 1 under Review Questions.
Figure 2.14  New Labor Market Equilibrium after Demand Shifts Right

Wages for Paralegals

We

We*

Market Supply

Old Market Demand

New Market Demand

Number of Workers

0
Figure 2.15  New Labor Market Equilibrium after Supply Shifts Left
Figure 2.16  New Labor Market Equilibrium after Supply Shifts Right

[Diagram showing the new labor market equilibrium after supply shifts right.]

- Old Market Supply
- New Market Supply
- Market Demand
- Wage $W_e$
- Wage $W_e''$
- Number of Workers

The diagram illustrates the shift in the labor market equilibrium due to a rightward shift in supply, with the new equilibrium wage and number of workers indicated.]
Disequilibrium and Nonmarket Influences

• The labor market is subject to forces that impede the adjustment of both wages and employment to changes in supply or demand:
  - Changing jobs often requires an employee to invest in new skills or bear the costs of moving.
  - Hiring workers can involve an initial investment in search and training, while firing them or cutting their wages can be perceived as unfair, which may affect moral and productivity.

• Other barriers to adjustment are rooted in nonmarket forces:
  - Government programs or laws such as minimum wage laws usually serve to keep wages above market levels, which could result in widespread unemployment.
  - Customs or institutions (labor unions) also constrain the choices of individuals and firms.
2.3 Applications of the Theory

Who Is Underpaid and Who Is Overpaid?

- The concepts of underpayment and overpayment have to do with the *social* issue of producing goods and services in the least-costly way, hence the comparison of overpayment and underpayment with *market-clearing wage*.

Above-Market Wages

- Workers whose wages are higher than the market-clearing wage are considered to be *overpaid* – two implications:
  - Employers are paying more than necessary to produce their output: \( W_H > W_e \).
  - More workers want jobs than they can find: \( Y > V \rightarrow ESL \) – see Figure 2.17.

- Wage reduction close to the level dictated by the market would be *Pareto-improving*. 
Figure 2.17 Effects of an Above-Market Wage
2.3 Applications of the Theory

Below-Market Wages

- Employees whose wages are below market-clearing levels are considered to be *underpaid*:
  - At below-market wages, employers face labor shortages due to $W_L < W_e$ – see Figure 2.18.
  - If workers are made to work at $W_L$ wage, it will be difficult for employers to find and keep workers, and those who remain will be dissatisfied and resentful; therefore, production of goods and services will be affected – see Example 2.2.
  - If wages were to increase close the market-clearing level ($W_e$), more workers will be attracted to the market and output would rise as employment would increase from $V$ to $X$. 
Figure 2.18  Effects of a Below-Equilibrium Wage

![Diagram showing the effects of a below-equilibrium wage with supply and demand curves, indicating points V, X, and Y where the demand for labor exceeds the supply at wage $W_L$ and below the equilibrium wage $W_e$.](image)
2.3 Applications of the Theory

Economic Rents

• With respect to the labor market, economic rents can be defined as the difference between the wage workers are actually paid on a job and the workers’ reservation wages.
  - Economic rents sum the area between the market-clearing wage and the labor supply curve – see Figure 2.19.

• The labor supply curve of any occupation or industry is a schedule of reservation wages that indicates the labor forthcoming at each wage level – each worker potentially has a different reservation wage, hence rents will differ for each.

• The reservation wage of a worker is the wage below which the worker would refuse (or quit) the job in question.
  - It is the opportunity cost to the individual worker for giving up hours of leisure for market work.
Figure 2.19  Labor Supply to the Military: Different Preferences Imply Different “Rents”
2.3 Applications of the Theory

Unemployment and Responses to Technological Change Across Countries

- The strength of nonmarket forces: government programs, laws, customs or institutions (labor unions) varies across countries.

- Theoretically, if wages are held above the market-clearing levels, there will be excess supply of labor (ESL or unemployment), and this ESL or unemployment would worsen if the labor demand curve shifts to the left.

- Nonmarket forces, which can prolong the duration of unemployment, are probably much stronger in most of Europe than in North America.
  - Unemployment rates are much higher in most European countries because of their generous unemployment compensation programs and laws (severance pay).