CHAPTER 17 OUTLINE

17.1 QUALITY UNCERTAINTY AND THE MARKET FOR LEMONS

- **asymmetric information** Situation in which a buyer and a seller possess different information about a transaction.

The Market for Used Cars

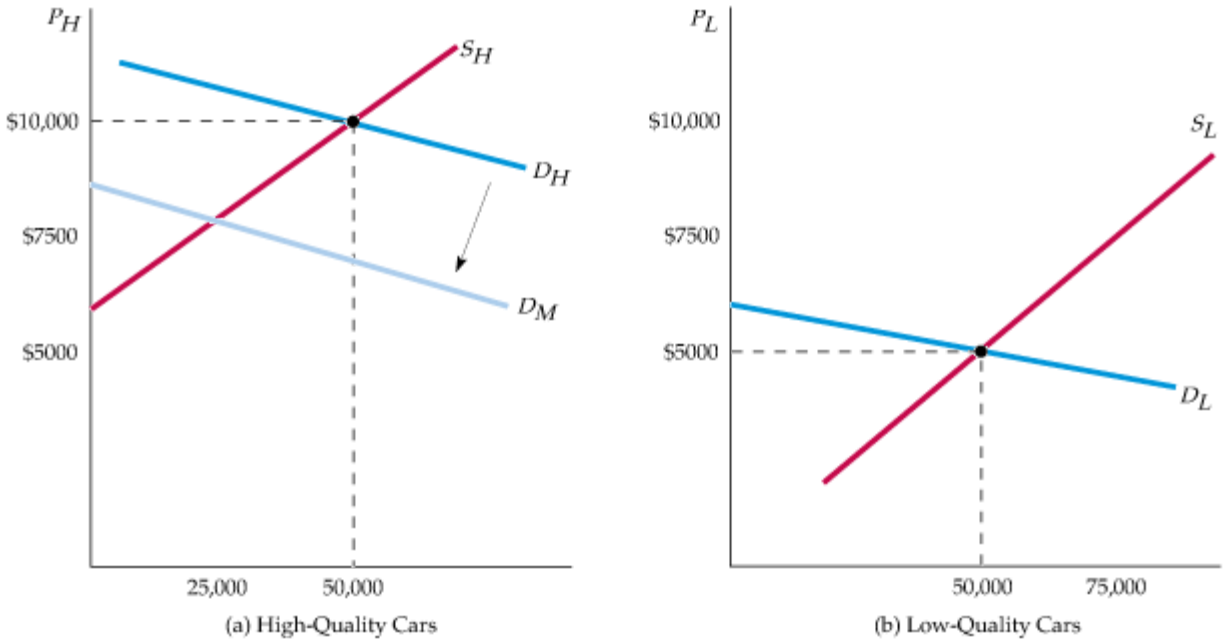
Figure 17.1

The Market for Used Cars

When sellers of products have better information about product quality than buyers, a "lemons problem" may arise in which low-quality goods drive out high quality goods.

In **(a)** the demand curve for high-quality cars is D_H.

However, as buyers lower their expectations about the average quality of cars on the market, their perceived demand shifts to D_M.



17.1 QUALITY UNCERTAINTY AND THE MARKET FOR LEMONS

- **asymmetric information** Situation in which a buyer and a seller possess different information about a transaction.

The Market for Used Cars

Figure 17.1

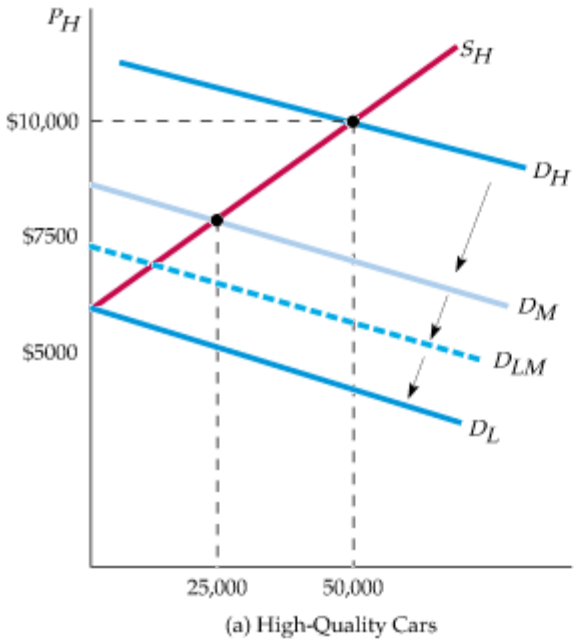
The Market for Used Cars (continued)

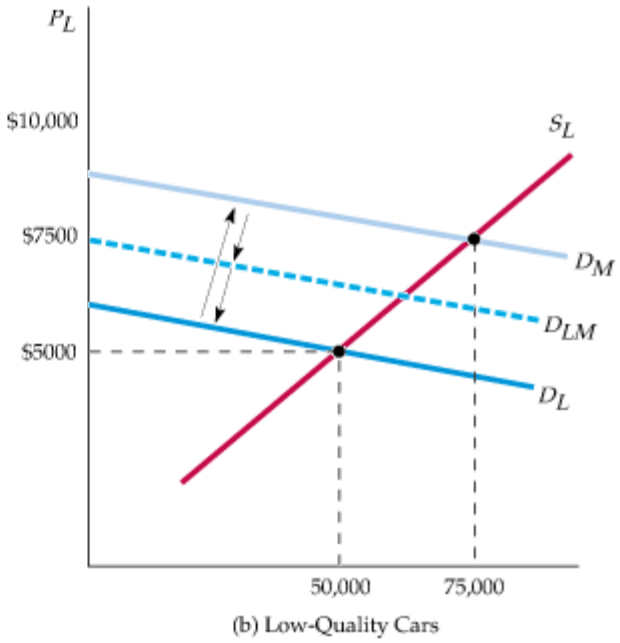
Likewise, in **(b)** the perceived demand curve for low-quality cars shifts from D_L to D_M.

As a result, the quantity of high-quality cars sold falls from 50,000 to 25,000,

and the quantity of low-quality cars sold increases from 50,000 to 75,000.

Eventually, only low quality cars are sold.





Chapter 17: Markets with Asymmetric Information

17.1 QUALITY UNCERTAINTY AND THE MARKET FOR LEMONS

The Market for Used Cars

The lemons problem: With asymmetric information, low-quality goods can drive high-quality goods out of the market.

Implications of Asymmetric Information

Adverse Selection

- **adverse selection** Form of market failure resulting when products of different qualities are sold at a single price because of asymmetric information, so that too much of the low-quality product and too little of the high-quality product are sold.

17.1 QUALITY UNCERTAINTY AND THE MARKET FOR LEMONS

Implications of Asymmetric Information

The Market for Insurance

People who buy insurance know much more about their general health than any insurance company can hope to know, even if it insists on a medical examination.

As a result, adverse selection arises, much as it does in the market for used cars.

The Market for Credit

Credit card companies and banks can, to some extent, use computerized credit histories, which they often share with one another, to distinguish low-quality from high-quality borrowers.

Many people, however, think that computerized credit histories invade their privacy.

17.1 QUALITY UNCERTAINTY AND THE MARKET FOR LEMONS

The Importance of Reputation and Standardization

Asymmetric information is also present in many other markets. Here are just a few examples:

- **Retail stores:** Will the store repair or allow you to return a defective product?
- **Dealers of rare stamps, coins, books, and paintings:** Are the items real or counterfeit?
- **Roofers, plumbers, and electricians:** When a roofer repairs or renovates the roof of your house, do you climb up to check the quality of the work?
- **Restaurants:** How often do you go into the kitchen to check if the chef is using fresh ingredients and obeying health laws?

17.1 QUALITY UNCERTAINTY AND THE MARKET FOR LEMONS

EXAMPLE 17.1 Lemons in Major League Baseball

Asymmetric information is prominent in the free-agent market. One potential purchaser, the player's original team, has better information about the player's abilities than other teams have.

TABLE 17.1 Player Disability

	Days Spent on Disabled List per Season		
	Precontract	Postcontract	Percentage Change
All players	4.73	12.55	165.4
Renewed players	4.76	9.68	103.4
Free agents	4.67	17.23	268.9

17.2 MARKET SIGNALING

- **market signaling** Process by which sellers send signals to buyers conveying information about product quality.

To be strong, a signal must be easier for high-productivity people to give than for low-productivity people to give, so that high-productivity people are more likely to give it.

A Simple Model of Job Market Signaling

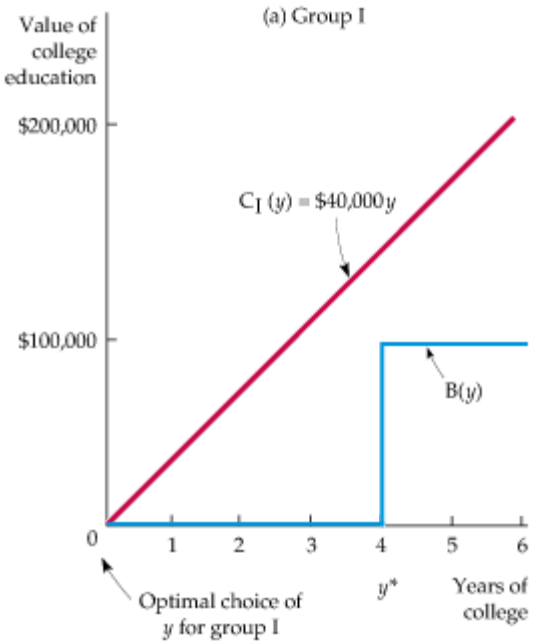
Equilibrium

Figure 17.2

Signaling

Education can be a useful signal of the high productivity of a group of workers if education is easier to obtain for this group than for a low-productivity group.

In **(a)**, the low-productivity group will choose an education level of $y = 0$ because the cost of education is greater than the increased earnings resulting from education.



A Simple Model of Job Market Signaling

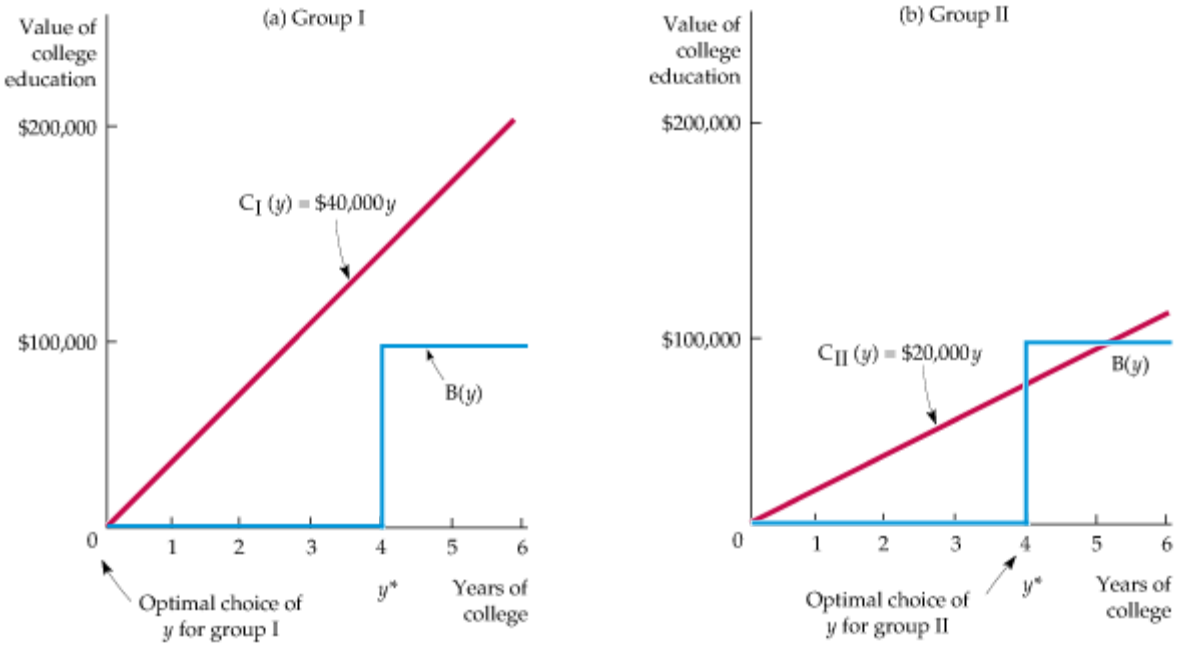
Equilibrium

Figure 17.2

Signaling

Education can be a useful signal of the high productivity of a group of workers if education is easier to obtain for this group than for a low-productivity group.

However, in **(b)**, the high-productivity group will choose an education level of $y^* = 4$ because the gain in earnings is greater than the cost.



17.2 MARKET SIGNALING

A Simple Model of Job Market Signaling

Cost–Benefit Comparison

In deciding how much education to obtain, people compare the benefit of education with the cost.

People in each group make the following cost-benefit calculation: *Obtain the education level* y* *if the benefit (i.e., the increase in earnings) is at least as large as the cost of this education.*

Guarantees and Warranties

Firms that produce a higher-quality, more dependable product must make consumers aware of this difference. But how can they do it in a convincing way?

The answer is *guarantees* and *warranties*.

Guarantees and warranties effectively signal product quality because an extensive warranty is more costly for the producer of a low-quality item than for the producer of a high-quality item.

EXAMPLE 17.2 Working into the Night

Job market signaling does not end when one is hired. This is especially true for workers in knowledge-based fields such as engineering, computer programming, finance, law, management, and consulting.

Given this asymmetric information, what policy should employers use to determine promotions and salary increases? Workers can often signal talent and productivity by *working harder and longer hours*.

Employers rely increasingly on the signaling value of long hours as rapid technological change makes it harder for them to find other ways of assessing workers' skills and productivity. The worker will know more about his abilities than the employer.

17.3 MORAL HAZARD

- **moral hazard** When a party whose actions are unobserved can affect the probability or magnitude of a payment associated with an event.

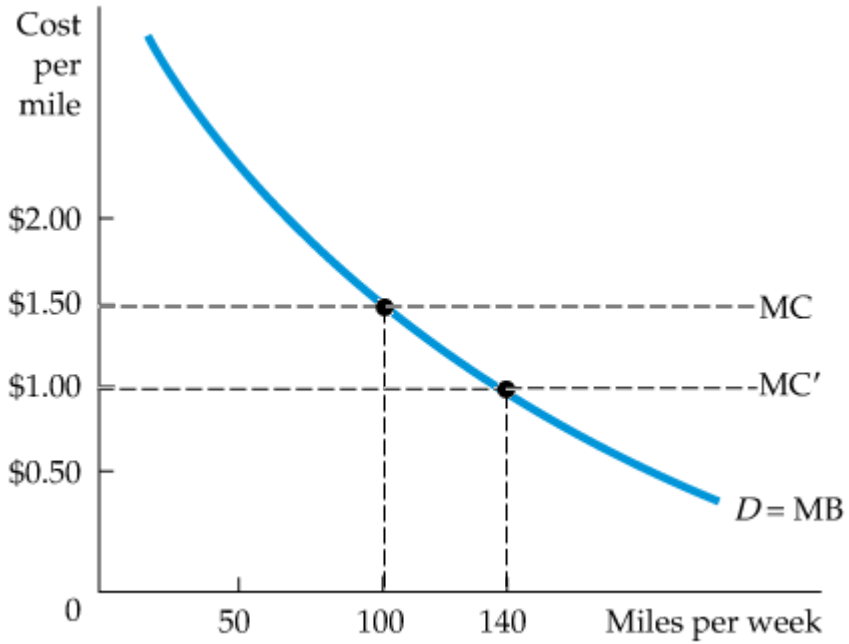
Figure 17.3

The Effects of Moral Hazard

Moral hazard alters the ability of markets to allocate resources efficiently. *D* gives the demand for automobile driving.

With no moral hazard, the marginal cost of transportation MC is $1.50 per mile; the driver drives 100 miles, which is the efficient amount.

With moral hazard, the driver perceives the cost per mile to be MC = $1.00 and drives 140 miles.



EXAMPLE 17.3

Reducing Moral Hazard: Warranties of Animal Health

For buyers of livestock, information about the animals' health is very important.

Because of asymmetric information in the livestock market, most states require warranties on the sale of livestock.

Although warranties solve the problem of the seller having better information than the buyer, they also create a form of moral hazard.

In response to the moral hazard problem, many states have modified their animal warranty laws by requiring sellers to tell buyers whether livestock are diseased at the time of sale.

17.4 THE PRINCIPAL–AGENT PROBLEM

- **principal–agent problem** Problem arising when agents (e.g., a firm's managers) pursue their own goals rather than the goals of principals (e.g., the firm's owners).

- **agent** Individual employed by a principal to achieve the principal's objective.

- **principal** Individual who employs one or more agents to achieve an objective.

17.4 THE PRINCIPAL–AGENT PROBLEM

The Principal–Agent Problem in Private Enterprises

Most large firms are controlled by management.

Managers of private enterprises can thus pursue their own objectives.

However, there are limitations to managers' ability to deviate from the objectives of owners.

First, stockholders can complain loudly when they feel that managers are behaving improperly.

Second, a vigorous market for corporate control can develop.

Third, there can be a highly developed market for managers.

17.4 THE PRINCIPAL–AGENT PROBLEM

EXAMPLE 17.4 CEO Salaries

CEO compensation has increased sharply over time.

For years, many economists believed that executive compensation reflected an appropriate reward for talent.

Recent evidence, however, suggests that managers have been able to increase their power over boards of directors and have used that power to extract compensation packages that are out of line with their economic contributions.

First, most boards of directors do not have the necessary information or independence to negotiate effectively with managers.

Second, managers have introduced forms of compensation that camouflage the extraction of rents from shareholders.

17.4 THE PRINCIPAL–AGENT PROBLEM

The Principal–Agent Problem in Public Enterprises

The principal–agent framework can also help us understand the behavior of the managers of public organizations.

Although the public sector lacks some of the market forces that keep private managers in line, government agencies can still be effectively monitored.

First, managers of government agencies care about more than just the size of their agencies.

Second, much like private managers, public managers are subject to the rigors of the managerial job market.

EXAMPLE 17.5

Managers of Nonprofit Hospitals as Agents

Do the managers of nonprofit organizations have the same goals as those of for-profit organizations?

In a study of 725 hospitals, from 14 major hospital chains, researchers compared the return on investment and average costs of nonprofit and for-profit hospitals to determine if they performed differently.

The study found that after adjusting for services performed, the average cost of a patient day in nonprofit hospitals was 8 percent higher than in for-profit hospitals.

Without the competitive forces faced by for-profit hospitals, nonprofit hospitals may be less cost-conscious and therefore less likely to serve appropriately as agents for their principals—namely, society at large.

17.4 THE PRINCIPAL–AGENT PROBLEM

Incentives in the Principal–Agent Framework

TABLE 17.2 Revenue from Making Watches

	Bad Luck	Good Luck
Low effort ($a = 0$)	$10,000	$20,000
High effort ($a = 1$)	$20,000	$40,000

Suppose, for example, that the owners offer the repairperson the following payment scheme:

$$\begin{aligned} &\text{If } R = \$10{,}000 \text{ or } \$20{,}000,\ w = 0 \\ &\text{If } R = \$40{,}000,\ w = \$24{,}000 \end{aligned} \qquad \textbf{(17.1)}$$

Under this system, the repairperson will choose to make a high level of effort.

Incentives in the Principal–Agent Framework

This is not the only payment scheme that will work for the owners, however.

Suppose they contract to have the worker participate in the following revenue-sharing arrangement. When revenues are greater than $18,000,

$$w = R - \$18{,}000 \qquad \textbf{(17.2)}$$

(Otherwise, the wage is zero.)

In this case, if the repairperson makes a low effort, he receives an expected payment of $1000. But if he makes a high level of effort, his expected payment is $12,000

*17.5 MANAGERIAL INCENTIVES IN AN INTEGRATED FIRM

- **horizontal integration** Organizational form in which several plants produce the same or related products for a firm.

- **vertical integration** Organizational form in which a firm contains several divisions, with some producing parts and components that others use to produce finished products.

*17.5 MANAGERIAL INCENTIVES IN AN INTEGRATED FIRM

Asymmetric Information and Incentive Design in the Integrated Firm

In an integrated firm, division managers are likely to have better information about their different operating costs and production potential than central management has. This asymmetric information causes two problems.

1. How can central management elicit accurate information about divisional operating costs and production potential from divisional managers?

2. What reward or incentive structure should central management use to encourage divisional managers to produce as efficiently as possible?

*17.5 MANAGERIAL INCENTIVES IN AN INTEGRATED FIRM

Asymmetric Information and Incentive Design in the Integrated Firm

For example, if the manager's estimate of the feasible production level is Q_f, the annual bonus in dollars, B, might be

$$B = 10{,}000 - .5(Q_f - Q) \qquad \textbf{(17.3)}$$

where Q is the plant's actual output, 10,000 is the bonus when output is at capacity, and .5 is a factor chosen to reduce the bonus if Q is below Q_f.

We will use a slightly more complicated formula than the one in (17.3) to calculate the bonus:

$$\text{If } Q > Q_f, B = .3Q_f + .2(Q - Q_f)$$
$$\text{If } Q \leq Q_f, B = .3Q_f - .5(Q_f - Q) \qquad \textbf{(17.4)}$$

The parameters (.3, .2, and .5) have been chosen so that each manager has the incentive to reveal the *true* feasible production level *and* to make Q, the actual output of the plant, as large as possible.

*17.5 MANAGERIAL INCENTIVES IN AN INTEGRATED FIRM

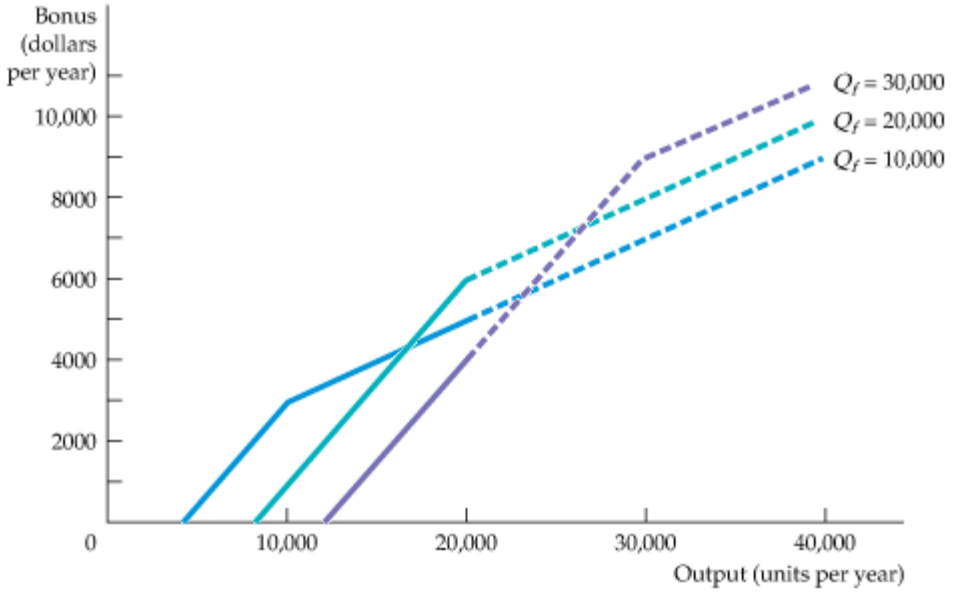
Asymmetric Information and Incentive Design in the Integrated Firm

Figure 17.4

Incentive Design in an Integrated Firm

A bonus scheme can be designed that gives a manager the incentive to estimate accurately the size of the plant.

If the manager reports a feasible capacity of 20,000 units per year, equal to the actual capacity, then the bonus will be maximized (at $6000).



*17.5 MANAGERIAL INCENTIVES IN AN INTEGRATED FIRM

Applications

Companies are learning that bonus schemes provide better results.

The salesperson can be given an array of numbers showing the bonus as a function of both the sales target chosen by the salesperson and the actual level of sales.

Salespeople will quickly figure out that they do best by reporting feasible sales targets and then working as hard as possible to meet them.

17.6 ASYMMETRIC INFORMATION IN LABOR MARKETS: EFFICIENCY WAGE THEORY

- **efficiency wage theory** Explanation for the presence of unemployment and wage discrimination which recognizes that labor productivity may be affected by the wage rate.

- **shirking model** Principle that workers still have an incentive to shirk if a firm pays them a market-clearing wage, because fired workers can be hired somewhere else for the same wage.

- **efficiency wage** Wage that a firm will pay to an employee as an incentive not to shirk.

17.6 ASYMMETRIC INFORMATION IN LABOR MARKETS: EFFICIENCY WAGE THEORY

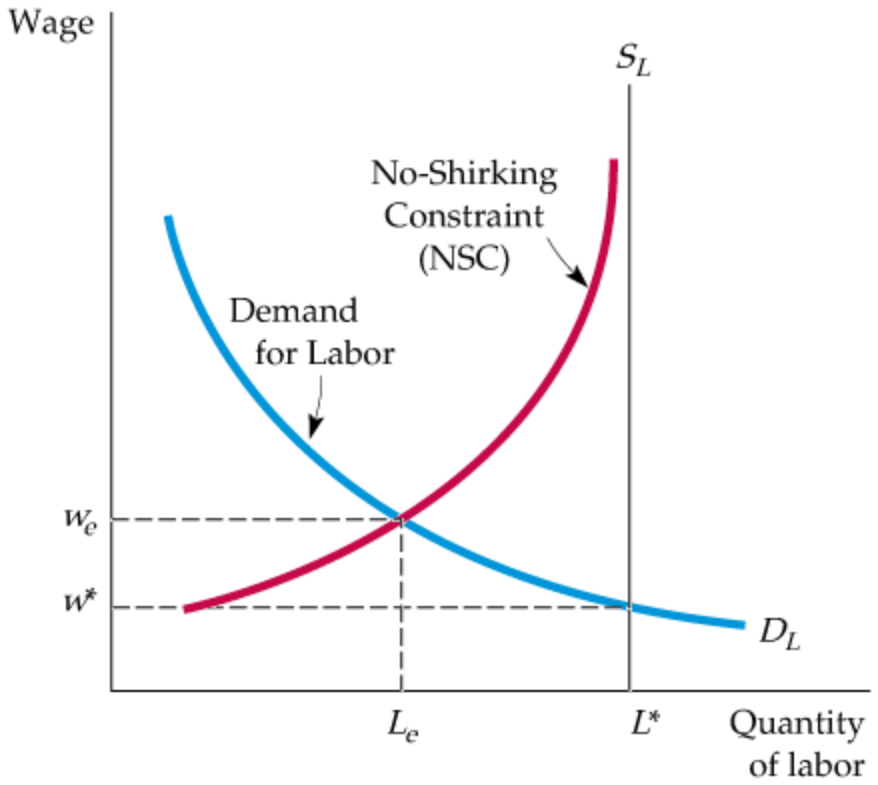
Figure 17.5

Unemployment in a Shirking Model

Unemployment can arise in otherwise competitive labor markets when employers cannot accurately monitor workers.

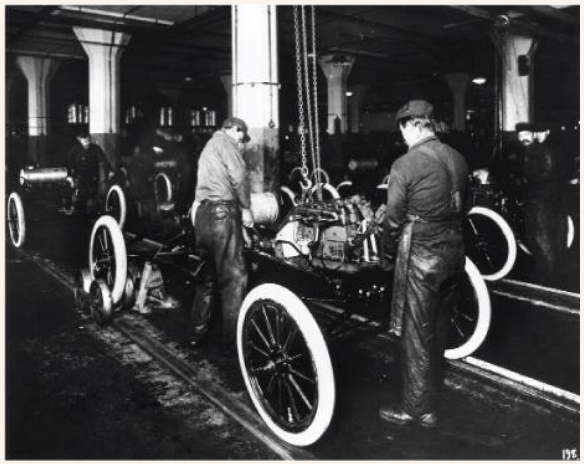
Here, the "no shirking constraint" (NSC) gives the wage necessary to keep workers from shirking.

The firm hires L_e workers (at a higher than competitive efficiency wage w_e), creating $L^* - L_e$ of unemployment.



17.6 ASYMMETRIC INFORMATION IN LABOR MARKETS: EFFICIENCY WAGE THEORY

EXAMPLE 17.6 Efficiency Wages at Ford Motor Company



One of the early examples of the payment of efficiency wages can be found in the history of Ford Motor Company.

Ford needed to maintain a stable workforce, and Henry Ford (and his business partner James Couzens) provided it.

In 1914, when the going wage for a day's work in industry averaged between $2 and $3, Ford introduced a pay policy of $5 a day. The policy was prompted by improved labor efficiency, not generosity.

Although Henry Ford was attacked for it, his policy succeeded. His workforce did become more stable, and the publicity helped Ford's sales.