

## Chapter 17

### Markets with Asymmetric Information

#### Introduction

- Frequently a seller or producer knows more about the quality of the product than the buyer does
- Managers know more about costs, competitive position and investment opportunities than firm owners

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#### Quality Uncertainty and the Market for Lemons

- ( ) information is a situation in which a buyer and a seller possess different information about a transaction
  - The lack of complete information when purchasing a used car increases the risk of the purchase and lowers the value of the car.
  - Markets for insurance, financial credit and employment are also characterized by asymmetric information about product quality

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#### The Market for Used Cars

- Assume
  - Two kinds of cars – high quality and low quality
  - Buyers and sellers can distinguish between the cars
  - There will be two markets – one for high quality and one for low quality

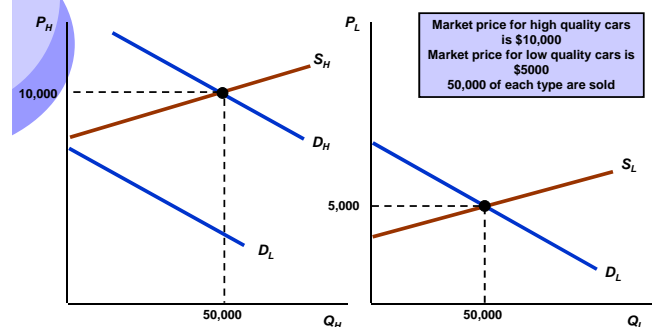
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#### The Market for Used Cars

- ( ) market
  - $S_H$  is supply and  $D_H$  is demand for high quality
- ( ) market
  - $S_L$  is supply and  $D_L$  is demand for low quality
- $S_H$  is higher than  $S_L$  because owners of high quality cars need more money to sell them
- $D_H$  is higher than  $D_L$  because people are willing to pay more for higher quality

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#### The Lemons Problem



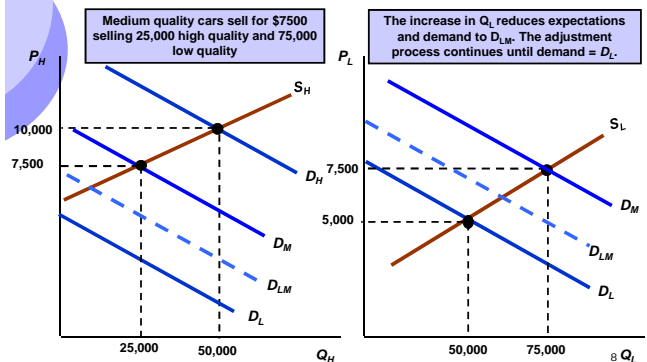
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## The Market for Used Cars

- ( ) know more about the quality of the used car than the buyer
- Initially buyers may think the odds are 50/50 that the car is high quality
  - Buyers will view all cars as medium quality with demand  $D_M$
- However, fewer high quality cars (25,000) and more low quality cars (75,000) will now be sold
- ( ) demand will now shift

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## The Lemons Problem



## The Market for Used Cars

- With ( ) information:
  - Low quality goods drive high quality goods out of the market- the lemons problem.
  - The market has failed to produce mutually beneficial trade.
  - Too many low and too few high quality cars are on the market.
  - ( ) selection occurs; the only cars on the market will be low quality cars.

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## Market for Insurance

- Older individuals have difficulty purchasing health insurance at almost any price
- They know more about their health than the insurance company
- Because unhealthy people are more likely to want insurance, proportion of unhealthy people in the pool of insured people rises
- Price of insurance rises so healthy people with low risk drop out – proportion of unhealthy people rises increasing price more

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## Market for Insurance

- If auto insurance companies are targeting a certain population – males under 25
- They know some of the males have low probability of getting in an accident and some have a high probability
- If can't distinguish among insured, it will base premium on the average experience
- Some with low risk will choose not to insure and with raises the accident probability and rates

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## Market for Insurance

- A possible solution to this problem is to pool risks
  - Health insurance – government takes on role as with Medicare program
    - Problem of adverse selection is eliminated
  - Insurance companies will try to avoid risk by offering group health insurance policies at places of employment and thereby spreading risk over a large pool

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## Importance of Reputation and Standardization

- ( ) Information and Daily Market Decisions
  - Retail sales – return policies
  - Antiques, art, rare coins – real or counterfeit
  - Home repairs – unique information
  - Restaurants – kitchen status

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## Implications of Asymmetric Information

- How can these producers provide high-quality goods when asymmetric information will drive out high-quality goods through adverse selection.
  - ( )
    - You hear about restaurants or stores that have good or bad service and quality
  - Standardization
    - Chains that keep production the same everywhere – McDonalds, Olive Garden

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## Implications of Asymmetric Information

- You look forward to a Big Mac when traveling, even if you would not typically buy one at home, because you know what to expect.
- Holiday Inn once advertised “No Surprises” to address the issue of adverse selection.

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## Market Signaling

- The process of sellers using signals to convey information to buyers about the product's quality.
- For example, how do workers let employers know they are productive so they will be hired?

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## Market Signaling

- Weak signal could be dressing well
  - Is weak because even unproductive employees can dress well
- ( ) Signal
  - To be effective, a signal must be easier for high quality sellers to give than low quality sellers.
  - Example
    - Highly productive workers signal with educational attainment level.

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## Model of Job Market Signaling

- Assume two groups of workers
  - Group I: Low productivity
    - Average Product & Marginal Product = 1
  - Group II: High productivity
    - Average Product & Marginal Product = 2
  - The workers are equally divided between Group I and Group II
    - Average Product for all workers = 1.5

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## Model of Job Market Signaling

- Competitive Product Market
  - $P = \$10,000$
  - Employees average 10 years of employment
  - Group I Revenue = \$100,000
    - (10,000/yr. x 10 years)
  - Group II Revenue = \$200,000
    - (20,000/yr. X 10 years)

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## Model of Job Market Signaling

- With Complete Information
  - $w = MRP$
  - Group I wage = \$10,000/yr.
  - Group II wage = \$20,000/yr.
- With Asymmetric Information
  - $w = \text{average productivity}$
  - Group I & II wage = \$15,000

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## Model of Job Market Signaling

- If use signaling with education
  - $y = \text{education index (years of higher education)}$ 
    - Assume all benefits encompassed in years of education
  - $C = \text{cost of attaining educational level } y$ 
    - Tuition, books, opportunity cost, etc.
  - Group I  $\rightarrow C_I(y) = \$40,000y$
  - Group II  $\rightarrow C_{II}(y) = \$20,000y$

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## Model of Job Market Signaling

- Cost of education is greater for the low productivity group than for high productivity group
  - Low productivity workers may simply be less studious
  - Low productivity workers progress more slowly through degree program

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## Model of Job Market Signaling

- Assume education does not increase productivity with only value as a signal
- Find equilibrium where people obtain different levels of education and firms look at education as a signal
- ( ):
  - $y^*$  signals GII and wage = \$20,000
  - Below  $y^*$  signals GI and wage = \$10,000

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## Model of Job Market Signaling

- Decision Rule:
  - Anyone with  $y^*$  years of education or more is a Group II person offered \$20,000
  - Below  $y^*$  signals Group I and offered a wage of \$10,000
- $y^*$  is arbitrary, but firms must identify people correctly

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## Model of Job Market Signaling

- How much education will individuals obtain given that firms use this decision rule?
- Benefit of education  $B(y)$  is increase in wage associated with each level of education
- $B(y)$  initially 0 which is the \$100,000 base 10 year earnings
  - Continues to be zero until reach  $y^*$

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## Model of Job Market Signaling

- There is no reason to obtain an education level between 0 and  $y^*$  because earnings are the same
- Similarly, there is no incentive to obtain more than  $y^*$  level of education because once hit the  $y^*$  level of pay, there are no more increases in wages

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## Model of Job Market Signaling

- How much education to choose is a benefit cost analysis
- Goal: obtain the education level  $y^*$  if the benefit (increase in earnings) is at least as large as the cost of the education
- Group I:
  - $\$100,000 < \$40,000y^*$ ,  $y^* > 2.5$
- Group II:
  - $\$100,000 < \$20,000y^*$ ,  $y^* < 5$

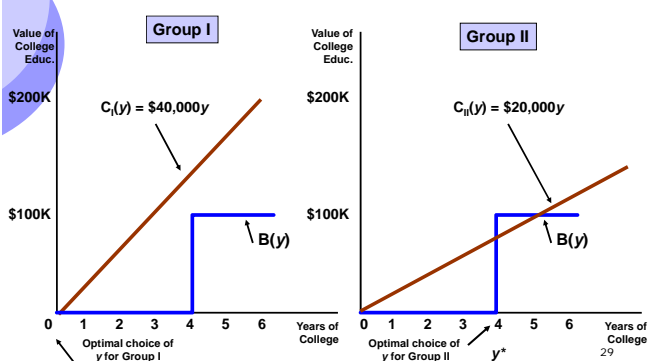
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## Model of Job Market Signaling

- This is an equilibrium as long as  $y^*$  is between 2.5 and 5
- If  $y^* = 4$ 
  - People in group I will find education does not pay and will not obtain any
  - People in group II will find education DOES pay and will obtain  $y^* = 4$
- Here, firms will read the signal of education and pay each group accordingly

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## Signaling



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## Signaling

- ( ) does increase productivity and provides a useful signal about individual work habits even if education does not change productivity.

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## Market Signaling

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- ( ) and Warranties
  - Signaling to identify high quality and dependability
  - Effective decision tool because the cost of warranties to low-quality producers is too high

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## Moral Hazard

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- ( ) occurs when the insured party whose actions are unobserved can affect the probability or magnitude of a payment associated with an event.
  - If my home is insured, I might be less likely to lock my doors or install a security system
  - Individual may change behavior because of insurance – **moral hazard**

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## The Principal – Agent Problem

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- Owners cannot completely monitor their employees – employees are better informed than owners
- This creates a ( ) which arises when agents pursue their own goals, rather than the goals of the principal.

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## The Principal – Agent Problem

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- Company owners are principals.
- Workers and managers are agents.
- Owners do not have complete knowledge.
- Employees may pursue their own goals even at a cost of reduce profits.

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## The Principal – Agent Problem – Private Enterprises

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- ( ) may pursue their own objectives.
  - Growth and larger market share to increase cash flow and therefore perks to the manager
  - Utility from job, from profit, and from respect of peers, power to control corporation, fringe benefits, long job tenure, etc.

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## The Principal – Agent Problem – Private Enterprises

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- ( ) to managers' ability to deviate from objective of owners
  - Stockholders can change managers
  - Takeover attempts if firm is poorly managed
  - Market for managers who maximize profits – those that perform get paid more so incentive to act for the firm

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## The Principal – Agent Problem – Private Enterprises

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- The problem of limited stockholder control shows up in executive compensation
  - *Business Week* showed that average CEO earned \$13.1 million and has continued to increase at a double-digit rate
  - For 10 public companies led by highest paid CEOs, there was negative correlation between CEO pay and company performance

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## CEO Salaries

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	Workers	CEOs
1990	\$18,187	\$2.9 Mil.
2009	\$19,552	\$5.2 Mil.

- In 1990 Dollars
- Workers' salary has increased only 7.5% while CEO's salary has increased 80%.

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## CEO Salaries

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- Although originally thought that executive compensation reflected reward for talent, recent evidence suggests managers have been able to manipulate boards to extract compensation out of line with economic contribution

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