

# Role of Information

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Telecommunications Economics

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## Agenda

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- Adverse Selection
- Moral Hazard
- Signaling
- Incentives
- Asymmetric Information

Varien, *Intermediate Microeconomics, Information (Chapter 14)*

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- This is not complete (nearly so), but I thought it might be useful sooner rather than later.

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- Jim

## Agenda

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- Adverse Selection
  - ▶ Lemon Market
  - ▶ Quality Choice

## Adverse Selection

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- Individuals most at risk select insurance, e.g.
- Market cannot observe quality (on one side of market).

Varien, *Intermediate Microeconomics, Information (Chapter 14)*

## Adverse Selection

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- Lemon Market
- Quality Choice

### Lemon Market

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- **Plums and Lemons**
- **Market Failure**
- **Bads drives good from market**

### Quality Choice

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### Moral Hazard

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- **Market cannot observe action of other side of market**
- **Hidden action problem**
- **Equilibrium inefficient relative to full information**

*Shy, Industrial Organization*

### Moral Hazard

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### Signaling

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- **Improves Market Performance**
- **Sheepskin Effect**
- **Warranties**
- **Indication of Higher Quality**

### Incentives

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- **How to get someone to do something.**
- **Land example**

### Land example

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**Assume:**  
**Perfect Information**  
 $x$ , effort  
 $q = f(x)$ ,  $p = 1$  (for simplicity)  
 $s(q)$  the amount paid (to agent)  
for  $q$  output

Varien, *Intermediate Microeconomics, Information (Chapter 14)*

### Land example

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**then: principal:  $q - s(q)$**   
(to maximize profit)  
 **$s(q) - c(x) = s(f(x)) - c(x)$**   
(agent's utility)  
 **$\max f(x) - s(f(x))$**   
such that  $s(f(x)) - c(x) \geq \underline{u}$   
(participation constraint)

### Land example

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$$\max f(x) - c(x) - \underline{u};$$

$$MP(x^*) = MC(x^*)$$

### Land example

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**Incentive compatibility constraint:**

$$s(f(x^*)) - c(x^*) \geq s(f(x)) - c(x)$$

(utility from  $x^*$  work is greater than any other amount of  $x$ )

### Land example

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**Solutions:**

- Rent
- Wage Labor
- Take-it-or-leave-it
- Sharecropping

### Land example

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**Solution:**

- Rent
  - ▶  $s(f(x^*)) - c(x^*) = f(x) - R$
- agent:
  - ▶  $\max s(f(x)) - c(x) = f(x) - R - c(x)$
- $R = f(x^*) - c(x^*) - \underline{u}$

### Land example

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#### Solution:

- Wage

- ▶  $s(x) = wx + K$

- agent:

- ▶  $\max s(f(x)) - c(x) = wx + K - c(x)$

- ▶  $w = MC(x)$  and , since  $w = MP(x^*)$

- ▶ is workers optimal choice

### Land example

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#### Solutions:

- Take-it-or leave-it

- ▶  $s(f(x)) = B^*$ , iff  $x \geq x^*$

- ▶  $s(f(x)) = 0$  otherwise, therefore choose  $x^*$

- ▶  $B^* - c(x) = \underline{u}$

### Land example

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#### Solutions:

- Sharecropping

- ▶  $s(x) = \alpha f(x) + F$

- agent:

- ▶  $\max s(x) = \alpha f(x) + F - c(x);$

- ▶  $\alpha MP(x^*) = MC(x^*)$

### Asymmetric Information

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