

## Making Decisions

September 19, 2006

Reading: Chapter 7

Microeconomics is the study of how individuals make decisions and interact

Main individuals (or agents) are producers and consumers

In this topic we examine how a general individual makes decisions: choosing among alternatives or choosing how much of an activity to do

In the following topics we will apply these general ideas to examine decision making by firms or producers, and households or consumers

## Making Decisions

- a. Opportunity costs
  - i. Explicit versus implicit costs
  - ii. Profit, accounting profit and economic profit
- b. Marginal analysis
  - i. Marginal cost
  - ii. Marginal benefit
  - iii. Marginal analysis
  - iv. Applications
- c. Sunk costs
- d. Present value – decision making when cost and benefit arise over time, not at once

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## Opportunity Costs

### Explicit versus implicit costs

**Explicit cost** involves the actual amount of money spent in doing something.

Example: college tuition.

Cost of doing something does not only involve explicit cost. Cost involves **opportunity cost**. Cost includes explicit cost + implicit cost

**Implicit cost** does not require an outlay of money, but is measured by the value (in dollar terms) of the opportunities or benefits that are forgone.

Example: earnings forgone when one goes to college.

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## Opportunity Costs

### Profit, Accounting Profit and Economic Profit

- Most people think of **profit** as the difference between a business's revenue minus explicit costs.
- **Accounting profit** the business's revenue minus the explicit costs and depreciation (reduction in the value of machinery due to wear and tear).
- **Economic profit** (**profit** from now on) is the business's revenue minus the opportunity cost of its resources. Usually much less than accounting profit. Takes into account costs like:
  - Implicit cost of capital – owner of capital could have received from next best alternative – interest on money
  - Opportunity cost of labor income foregone – wage from best alternative

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## Marginal Analysis

For many decisions individuals chose between doing something compared to doing something else. These are **either-or** decisions.

For these decisions, individuals can be taken to do something if net benefit (benefit minus cost) or profit is positive.

For many decisions individuals choose **how much** of an activity to do. In this case they are taken to compare the marginal cost of doing something to its marginal benefit. They will then choose the activity level at which **marginal cost = marginal benefit**.

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## Marginal Analysis

### Marginal Cost

The **marginal cost** of an activity is the additional cost incurred by doing one more unit of that activity.

**Marginal cost curve** shows the level of marginal cost for each level of activity

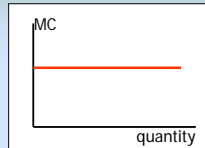


## Marginal Analysis

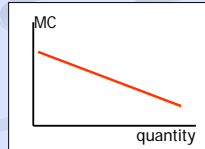
### Marginal Cost, cont.

There is **increasing marginal cost** from an activity when each additional unit of the activity costs more than the previous unit.

In many cases we have increasing marginal cost. Why?



But in some we have **constant marginal cost**.



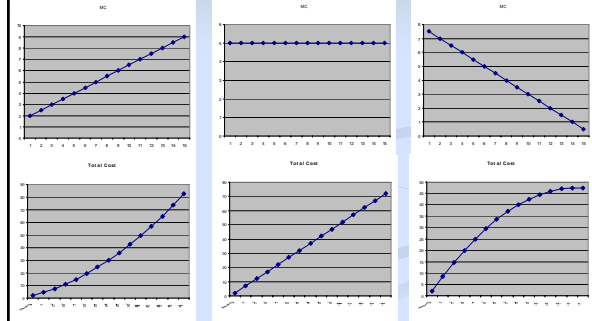
In some we even have **decreasing marginal cost** – gains due to specialization.

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## Marginal Analysis

### Marginal Cost, cont.

Relation between **total cost** and **marginal cost**: slope, sum



## Marginal Analysis

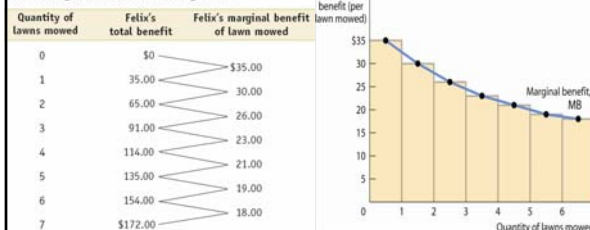
### Marginal Benefit

The **marginal benefit** from an activity is the additional benefit derived from undertaking one more unit of that activity.

**Marginal benefit curve** shows the marginal benefit for each level of activity.

There is **decreasing marginal benefit** from an activity when each additional unit of the activity produces less benefit than the previous unit. Why?

Felix's Marginal Benefit of Mowing Lawns



## Marginal Analysis

### Optimal quantity

The **optimal quantity** of an activity is the level that generates the maximum possible total net gain = total benefit - total cost.

The **principle of marginal analysis** says that the optimal quantity of an activity is the quantity at which marginal benefit is equal to marginal cost.

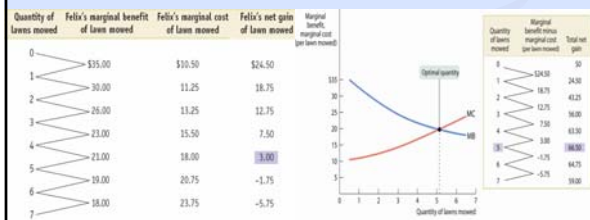
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## Marginal Analysis

### Optimal quantity

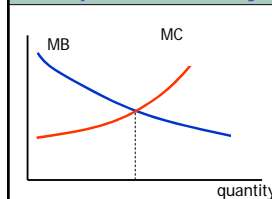
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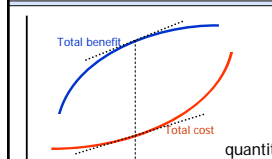


## Marginal Analysis

### The Optimal Quantity



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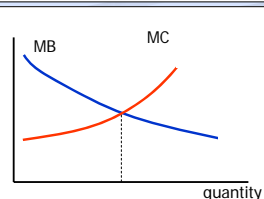
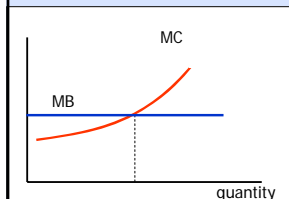
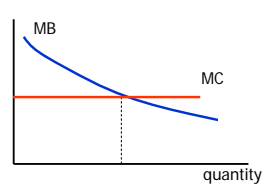
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## Marginal Analysis

### Applications

- For individuals: How much of a good to consume?
- For firms: How much of a good to produce?
- For society: How much of pollution abatement to have?



## Sunk Costs

A **sunk cost** is a cost that has already been incurred and is nonrecoverable.

If individuals are maximizing their net benefit, they should ignore their sunk costs in decisions about future actions. They have no influence on additional costs and benefits.

People often do consider them? Why? Uncertainty about future. Here we assume that away.

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## Present Value

Relevant when individuals make decision whose consequences extend into the future. Some costs and benefits come in the future.

Should people just add up the benefits at different dates and add up the costs at different dates and see if total benefit exceeds total cost and do it if it does?

Problem: an amount of money (say \$100) in hand now is not worth the same as \$100 next year.

When someone borrows money for a year, the **interest rate** is the price, calculated as a percentage of the amount borrowed, charged by the lender.

The interest rate can be used to compare the value of a dollar realized today with the value of a dollar realized later, because it correctly measures the cost of delaying a dollar of benefit (and the benefit of delaying a dollar of cost).

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## Present Value

### Concept

- \$100 today will give us  $\$100(1+r)$  next year (where  $r$  is the interest rate, like 1/10)
- So  $\$100(1+r)$  next year is worth \$100 today.
  - How do we get that?  $\$100(1+r)/(1+r)$ . So we divide the amount by  $(1+r)$ . Called discounting.
- So what is the present value of \$100 next year?
  - $\$100/(1+r)$ .
- What is the present value of \$100 two years from now?
  - $\$100/(1+r)^2$ .
- Present value of an amount  $\$X$  received  $N$  years from now
  - $\$X/(1+r)^N$

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## Present Value

### Using present value

The **net present value** of a project is the present value of current and future benefits minus the present value of current and future costs.

To decide on which project to choose:

1. Calculate present value of current and future benefits
2. Calculate present value of current and future costs
3. Calculate net present value
4. Choose project which gives higher present value

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