Chapter 21 & 13: Consumer theory & Costs of production

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Discussion section 4

October 10, 2025

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Outline

Today we will talk about:

- The theory of the consumer
  - budget constraints
  - indifference curves
- Costs of production

Budget constraints

Most consumers want to increase the quantity/quality of the goods they consume, but money isn't infinite :(

Consumers face a **budget constraint:**
the limit on the consumption bundles that a consumer can afford

Example: A consumer would like to purchase pasta and wine. They have $100 to spend, pasta costs $20 per plate and wine costs $10 per glass...

1. How much of each good could they consume?
2. What is the equation for their budget constraint?
3. What does their budget constraint look like graphically?
4. What happens if the price of pasta decreases to $10?
5. What happens if income increases to $160?

Representing preferences

How do we know which bundle of goods a consumer prefers?

We can represent preferences using **indifference curves:**
IC: a curve showing consumption bundles that give the consumer *equal levels of satisfaction*

The slope at any point on an indifference curve equals the **Marginal Rate of Substitution (MRS)**: the rate at which a consumer is willing to give up one unit of good X for another unit of good Y

We calculate MRS as follows:

$$MRS = \frac{MU_X}{MU_Y}$$

Properties of indifference curves:

1. Higher indifference curves are preferred to lower ones:
   1. More is better!
2. Indifference curves are downward sloping:
   1. in most cases a consumer likes both goods, so to decrease plates of pasta but keep the same satisfaction, we must increase glasses of wine
3. Indifference curves do not cross
   1. If they crossed, we would violate the assumption that people prefer more to less
4. Indifference curves are bowed inwards
   1. MRS is not constant... we are more willing to give up a good we already have an abundance of

Optimizing

A consumer wants to maximize their satisfaction given their budget constraint...

This is achieved by choosing the bundle where either:

- Their indifference curve is tangent to their budget constraint (where they touch... kind of)
- The MRS is equal to the slope of the budget constraint

When income or prices of goods change, our budget constraint does too, and so we would find ourselves on a new indifference curve at optimum...

Income & Substitution Effects

When the price of goods changes, the resulting change to the budget constraint and optimal bundle is a result of two effects:

1. **Income effect:** Change in consumption that results when a price change *moves the consumer to a higher or lower indifference curve*

2. **Substitution effect:** Change in consumption that results when a price change *moves the consumer along a given indifference curve to a point with a new MRS*

   ** A change in income results only in an income effect **

Costs of Production

A firm aims to maximize their profit:

$$\text{Profit} = \text{total revenue} - \text{total cost}$$

- total revenue: $TR = P \times Q$
- total cost is the sum of all **implicit** and **explicit** costs of inputs to production
  - **Implicit**: input costs which *do not* require monetary outlay from the firm
  - **Explicit**: input costs which *do* require a monetary outlay from the firm

Types of Profit

There are two types of profit we can consider:

Economic Profit:

total revenue less implicit *and* explicit costs

Accounting

total revenue less explicit costs *only*

Costs

Types of costs:

- Fixed costs: costs that do not vary with Q
- Variable costs: costs that vary with Q

Measures of costs:

- Average total cost (ATC): $ATC = TC/Q$
- Average fixed cost (AFC): $AFC = FC/Q$
- Average variable cost (AVC): $AVC = VC/Q$
- Marginal Cost: $MC = \Delta TC/\Delta Q$

Example

Consider a firm which produces pizzas:

A worker costs $100 and the firm has fixed costs of $200.

The following table shows the number of pizzas produced given varying numbers of workers. Let's add information for the marginal product, total cost, average total cost, and marginal cost.

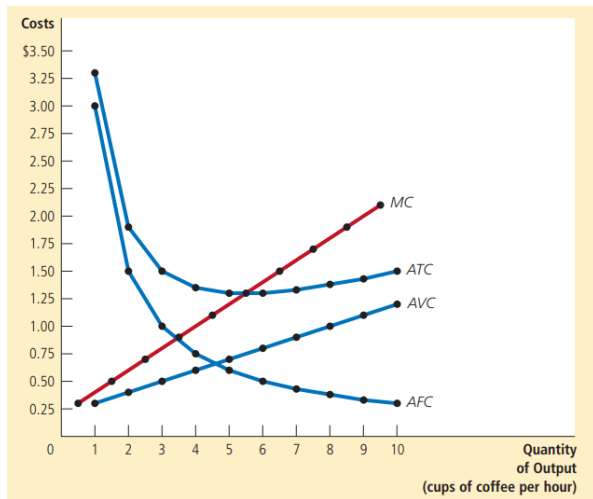| Workers	Output
0	0
1	20
2	45
3	80
4	100
5	110

What do costs look like?

Figure 1: Relationship between costs