

Costs

Chapter 12-1
(my version of it)

Laughter Curve

A woman hears from her doctor that she has only half a year to live.
The doctor advises her to marry an economist and to move to South Dakota.

Laughter Curve

“Will this cure my illness?” she asked.
No, but the half year will seem pretty long.”

Introduction

- In the supply process, people first offer their factors of production to the market.
- Then the factors are transformed by firms into goods that consumers want.
 - **Production** is the name given to that transformation of factors into goods.

The Role of the Firm

- The **firm** is an economic institution that transforms factors of production into consumer goods – it:
 - Organizes factors of production.
 - Produces goods and services.
 - Sells produced goods and services.

The Firm and the Market

- Firms are the production organizations that translate factors of production into consumer goods.

The Role of the Firm

- In the supply process, people offer their factors of production, such as land, labor, and capital, to the market
- Firms transform the factors into goods for consumers
 - **Production** is the transformation of factors into goods
- Ultimately, all supply comes from individuals because control the factors of production

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The Role of the Firm

- A **firm** is an economic institution that transforms factors of production into goods and services

- Firms** and/or
1. Organize factors of production
 2. Produce goods and services and/or
 3. Sell produced goods and services

- A **virtual firm** organizes production and subcontracts out all work
- Many of the organizational structures of business are being separated from the production process

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The Role of the Firm

- A **virtual firm** only organizes production.
 - Virtual firms subcontract out all work.
 - More and more of the organizational structure of business is being separated from the business.

Firms Maximize Profit

- The goal of a firm is to **maximize** profits
Profit = total revenue – total cost
- For economists, **total cost** is explicit payments to the factors of production plus the opportunity cost of the factors provided by the owners of the firm
- For economists, **total revenue** is the amount a firm receives for selling its product or service plus any increase in the value of the assets owned by the firm

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Firms Maximize Profit

- Economists and accountants measure profit differently
- **Accountants** focus on explicit costs and revenues
Accounting profit = explicit revenue – explicit cost
- **Economists** focus on **both** explicit and implicit costs and revenue
Economic profit = (explicit and implicit revenue) – (explicit and implicit cost)

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The Production Process

- The production process can be divided into the long run and the short run

Short run

- A firm is constrained in regard to what production decisions it can make
- Some inputs are fixed

Long run

- A firm chooses from all possible production techniques
 - All inputs are variable
- The terms long run and short run do not necessarily refer to specific periods of time, but to the flexibility the firm has in changing the level of output

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Production Tables and Production Functions

- Firms combine factors of production to produce goods and services
- A **production table** is a table showing the output resulting from various combinations of factors of production or inputs
- Real-world production tables are complicated
- This analysis will concentrate on short run production when in which one of the factors is fixed

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Production Tables and Production Functions

- A **production table** shows the output resulting from various combinations of factors of production or inputs.

Production Tables and Production Functions

- **Marginal product** is the additional output that will be forthcoming from an additional worker, other inputs remaining constant.

Production Tables and Production Functions

- **Average product** is calculated by dividing total output by the quantity of the output.

Production Tables and Production Functions

- **Production function** – a curve that describes the relationship between the inputs (factors of production) and outputs.

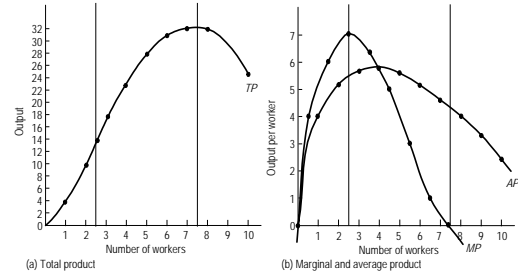
Production Tables and Production Functions

- The production function tells the maximum amount of output that can be derived from a given number of inputs.

A Production Table

Number of workers	Total output	Marginal product	Average product
0	0	4	—
1	4	6	4
2	10	7	5
3	17	6	5.7
4	23	5	5.8
5	28	3	5.6
6	31	1	5.2
7	32	0	4.6
8	32	2	4.0
9	30	5	3.3
10	25	5	2.5

A Production Function



A Production Table

# of workers	Total Output	Marginal Product	Average Product
0	0	4	—
1	4	6	4
2	10	7	5
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4	23	5	5.8
5	28	3	5.6
6	31	1	5.2
7	32	0	4.6
8	32	-2	4.0
9	30	-5	3.3
10	25	-5	2.5

Average product is the output per worker

Marginal product is the additional output that will be forthcoming from an additional worker, other inputs constant

The Law of Diminishing Marginal Productivity

- Both marginal and average productivities initially increase, but eventually they both decrease.

The Law of Diminishing Marginal Productivity

- This means that initially the production function exhibits increasing marginal productivity. **← NOT IN YOUR BOOK**
- Then it exhibits diminishing marginal productivity. **← THIS IS IN YOUR BOOK!**
- Finally, it exhibits negative marginal productivity.

The Law of Diminishing Marginal Productivity

- The most relevant part of the production function is that part exhibiting diminishing marginal productivity.

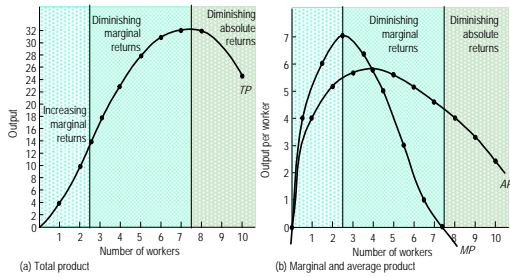
The Law of Diminishing Marginal Productivity

- **Law of diminishing marginal productivity** – as more and more of a variable input is added to an existing **Fixed input** after some point the additional output one gets from the additional input will fall.

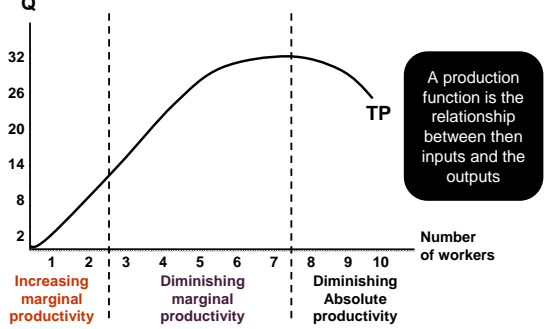
The Law of Diminishing Marginal Productivity

Number of workers	Total output	Marginal product	Average product	
0	0	4	—	Increasing marginal returns
1	4	6	4	
2	10	7	5	
3	17	6	5.7	Diminishing marginal returns
4	23	5	5.8	
5	28	3	5.6	
6	31	1	5.2	
7	32	0	4.6	Diminishing absolute returns
8	32	-2	4.0	
9	30	-5	3.3	
10	25	-5	2.5	

The Law of Diminishing Marginal Productivity

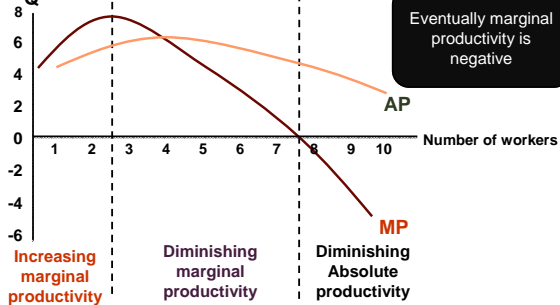


Graphing a Production Function



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Graphing Marginal and Average Productivity



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Law of Diminishing Marginal Productivity

# of workers	Total Output	Marginal Product	Average Product
0	0	4	---
1	4	6	4
2	10	7	5
3	17	6	5.7
4	23	5	5.8
5	28	3	5.6
6	31	1	5.2
7	32	0	4.6
8	32	-2	4.0
9	30	-5	3.3
10	25	-5	2.5

Law of diminishing marginal productivity states as more of a variable input is added to an existing fixed input, after some point the additional output from the additional input will fall

Increasing marginal productivity

Diminishing marginal productivity

Diminishing Absolute productivity

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The Law of Diminishing Marginal Productivity

- This law is also called the *flower pot law*.
- If it did not hold true, the world's entire food supply could be grown in a single flower pot.