

**Costs****Accounting versus Economics Costs**

Accounting costs are explicit, actual out of pocket expenses

Economic costs are explicit and implicit, actual out of pocket expenses and opportunity costs

**Definitions**

Total Cost = TFC + TVC

Total Fixed Cost, TFC, the cost incurred by a business whether or not they produce any goods, i.e. rent, property taxes, long term lease agreement

Total Variable Cost, TVC, the costs incurred by a business that are associated with increases in production, i.e. labor, raw materials, utilities

$$AC = TC/Q$$

$$AVC = TVC/Q$$

$$AFC = TFC/Q$$

Marginal cost= the cost of producing one more unit= change in TC/change in Q

**Graphing the cost curves****Important points**

1. The marginal cost curve intersects the average cost curve at the minimum point of the average cost curve. If the marginal costs are higher than the average cost, the average cost will be rising. If the marginal costs are below the average cost the average cost will be falling. Therefore, when the marginal cost intersects with the average cost, the average can not be rising or falling, it must be at its minimum point.
2. The AFC gets closer and closer to zero as the quantity produced increases. The fixed cost are being spread over more units.
3. Since  $AFC + AVC = AC$ , as Q increases AFC decreases, this causes AVC and AC to get closer and closer together as Q increases.
4. In the long run all costs are variable. So, in the long run  $TFC = 0$ , and  $TVC = TC$ .
5. The only reason we look at the **AVC** curve is to determine the competitive firm's short run supply curve. If P is greater than AVC the firm will continue to produce the good in the short run. We discuss this point later in the course.

**Practice Problem**

Fill in the table below.

Q	TC	MC	FC	VC	AC	AFC	AVC
0							
1	104	50					
2					73		

Winthrop University  
College of Business Administration

Principles of Microeconomics  
Cost Assignment

Prof. Pantuosco

Q	P	TR	TC	MR	MC	TFC	TVC	AFC	AVC	ATC
0	10		8							
1			15							
2			20							
3			26							
4			34							
5			44							
6			56							
7			70							
8			85							
9			100							

- a. Fill in the table.
- b. Assume the price is always \$10, remember  $TR = P * Q$
- c. Define MR, MC, TFC, TVC, AFC, AVC, ATC.
- d. Graph TFC, TVC, and TC.
- e. On a separate diagram below the cost curves, draw the ATC, MC, MR curves.
- f. At what quantity does the firm maximize their profits?

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The amount a firm produces is a function of the amount of labor and capital they use. In math terminology we would say  $Q = f(L,K)$ .

If the firm changes the amount of labor they use but keeps the amount of capital constant, then the quantity produced will change. The amount that the quantity changes by is called the marginal product of labor.

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Another way to measure cost is

$$TC = wL + rK$$

Where TC equals total costs.

W is the wage rate, L is the amount of labor, r is the rental cost of capital, and K is the amount of capital.

### Marginal Productivity

Change **one** input while holding the other input constant.

$MP_L$  the Marginal Product of Labor = change in Q/change in L (holding capital constant) the output produced by the next person hired.

The wage rate a person should be paid. Typically associated with commission sales, lawyers, doctors, professional athletes, actors.

$AP_L$  the Average Product of Labor (Q/L) the average amount produced by an employee.

Typically associated with the wage rate of a production line worker, or a retail clerk

### Returns to Scale

If **both** capital and labor change, quantity will change. The degree to which quantity changes let's us know the "returns to scale" of the firm (or industry)

Let's say that

when a firm uses 10 units of L and 10 units of capital they produce 30 units of good X.

**If they double both inputs what happens to the amount they produce?**

a. If the amount (Q) doubles it is called constant returns to scale.

$$L = 10 \quad K = 10 \quad Q = 30$$

$$L = 20 \quad K = 20 \quad Q = 60$$