

Economic Signals and How Much to Produce?

Law of Diminishing Returns

As marginal units of a variable input are added to a fixed quantity of some other inputs, the output that results will first increase, and then decrease and finally become negative.

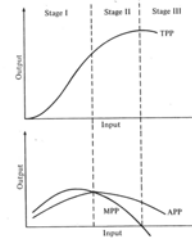
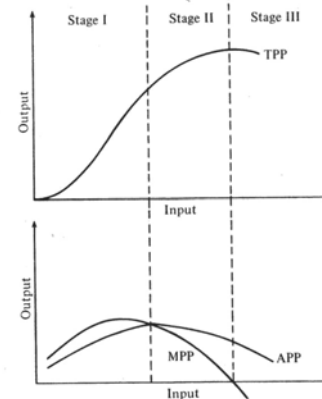
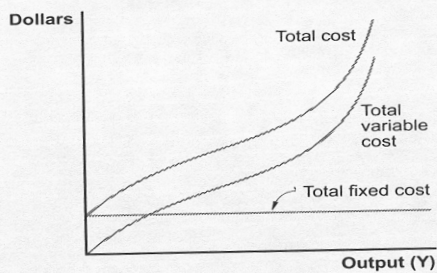


Figure 1-1. Typical total cost, variable cost, and fixed cost curves.



Production Function Stages

- *Stage 1* Output increasing at an increasing rate
– All rational decision makers would produce here
- *Stage 2* Output increasing at a decreasing rate
– The decision making stage
- *Stage 3* Output decreasing
– No rational decision makers would produce here

Law of Diminishing Returns

As marginal units of a variable input are added to a fixed quantity of some other inputs, the output that results will first and then decrease and finally become negative.

The Three Stages

- **Stage 1 Output increasing at an increasing rate**
 - All rational decision makers would continue producing here.
- **Stage 2 Output increasing at a decreasing rate**
 - The decision making stage
- **Stage 3 Output decreasing**
 - No rational decision makers would produce here

Three Key Points

- Profits not necessarily highest when total output or total physical product (TPP) is the highest
- Profits not necessarily highest when physical efficiency or APP is the greatest
- Making profit depends on the prices of inputs and outputs and how they relate to physical productivity

Two planning horizons:

- Short run – usually one production cycle, one growing season or one year
- Long run – multiple production cycles. A period long enough to make adjustments to fixed plant and equipment.

Two types of costs:

- Fixed Costs – costs which are incurred regardless of the amount of production
- Variable costs – costs which increase and decrease based upon the amount produced.

Fixed or variable?

- Fertilizer
- Purchased feed
- Property Insurance
- Gas, fuel & oil
- Family labor
- Hired Labor

Fixed Costs (DIRTI 5)

- Depreciation
- Interest
- Repairs
- Taxes
- Insurance



Annual Fix Cost Calculation

- Cost of Dairy Free Stall Barn \$200,000
- Salvage value \$ 20,000
- Estimated Useful Life 20 yrs
- Repair are estimated at 1%
- Taxes are 1% of purchase price
- Insurance is .5% of purchase price
- What is the estimated annual fixed costs?

DIRTI 5 Approximate Solution:

- Depr. = $(\$200,000 - \$20,000) / 20 = \$9,000$
- Int. = $(\$200,000 + \$20,000) / 2 * .10 = \$11,000$
- Repairs = $200,000 * .01 = 2,000$
- Taxes = $200,000 * .01 = 2,000$
- Insurance = $200,000 * .005 = 1,000$
- Total Annual Fixed Costs = \$25,000