

# AAE101: Intro to Ag. & Applied Econ.

## Discussion Section 8

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### Today's goal

To review about the short-run (SR) and long-run (LR) dynamics of a purely competitive market.

### Pure Competition

In a purely competitive market, the following conditions hold:

- Large number of firms.
- Firms offer a **standardized product**, i.e. identical or homogeneous.
- Firms are price takers, i.e. they cannot change the market price.
- There is free entry and exit to the market.

Firms in a perfectly competitive market ask the following three questions:

1. Should the firm produce?
2. If so, in what amount?
3. What economic profit will be earned?

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\*This handout is based on the corresponding handouts from previous years by Felipe Parra Escobar, Matt McKetty & Talita Silva. Modifications and additions in this version by Erick.

## The short-run

The firm can only attempt to maximize its profit by controlling its output, since it is a price-taker.

The firm has different approaches to see whether it is good to produce and if so, to try to maximize profits.

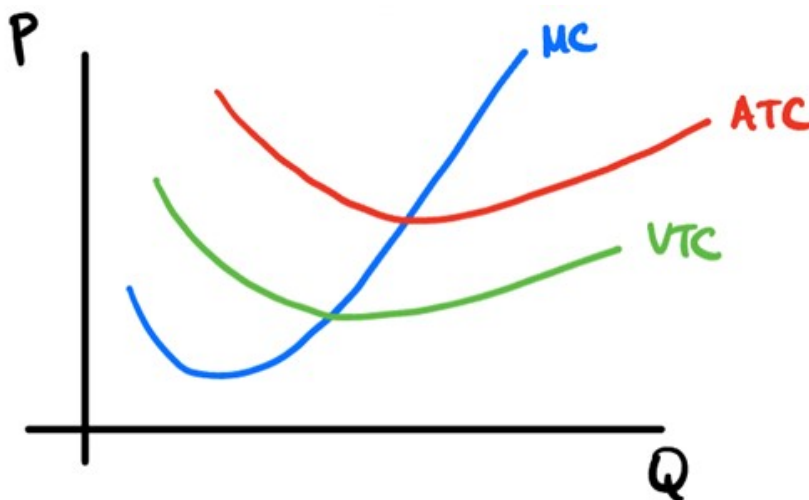
**Total revenue & total costs:** If the total revenue exceeds the total costs, then the firm will choose to produce. Then, the firm should look to the maximum profit that it can attain from the difference between total revenue and total costs.

**Marginal revenue & marginal costs:** In the short run, the firm will maximize profit or minimize loss by producing the output at which marginal revenue equals marginal cost ( $MR = MC$ ). When applied to a purely competitive firm, then this condition is the same as  $P = MC$ .

### Scenarios:

- When marginal cost is greater than marginal revenue: firms want to reduce their output level because the money they spend producing the next unit is greater than the money they receive by selling it.
- When marginal revenue is greater than marginal cost: firms want to increase their output level because the money they obtain for selling the next unit is greater than the money they spend producing it.

In the short run, the marginal cost curve is the same as its **supply curve**. Remember:



# The long-run

In the short-run, firms have unalterable fixed costs – like a plant.

In the long-run, firms can:

- Firms can expand or contract capacity.
- Firms can enter or exit. And they can do it easily.
- Decisions are based on the incentives of profits or losses.

Also, all firms have identical costs in the industry and the entry and exit of firms do not affect resource prices.

## The long-run adjustment process:

In a perfectly competitive industry, the long-run adjustment process ensures that the market reaches a state of equilibrium where firms are earning only normal profits.

If the industry is making economic profits, new firms will enter, increasing supply and lowering the price until profits are driven to zero.

If the industry is experiencing losses, some firms will exit, reducing supply and causing the price to rise until losses are eliminated.

**Equilibrium in the long-run:** After all long-run adjustments are completed in a purely competitive industry, product price will be exactly equal to, and production will occur at, each firm's minimum average total cost.

## Long Run Supply Curves:

- **Constant-cost industry:** Entry or exit does not affect long-run average total cost (LR ATC). They have constant resource prices. This is a special case.
- **Increasing-cost industry:** This is the most common case. LR ATC increases with expansion. There are specialized resources.
- **Decreasing-cost industry:** Entry causes decreased unit costs. Increase in output, lower prices for consumers. These types of industries show increasing costs if output contracts. Example: Personal Computer Industry.

**Technological Advances and Competition:** Entrepreneurs want to increase their profits beyond just their normal profits (they want positive economic profit).

- They can do this by innovating or by developing new products.
- Competition and Innovation lead to **creative Destruction**: The creation of new products and methods destroying the old products and methods.

## Practice Problems

**Short-Run:** Suppose a firm operates in a perfectly competitive market with the following information:

- The market price of the product is \$20.
- The firm's fixed costs are \$50.
- The variable cost of producing each unit is given by the following schedule:

| Quantity (Q) | Total Variable Cost (TVC) |
|--------------|---------------------------|
| 0            | 0                         |
| 1            | 10                        |
| 2            | 18                        |
| 3            | 25                        |
| 4            | 33                        |
| 5            | 42                        |
| 6            | 55                        |
| 7            | 70                        |

1. Calculate the total cost (TC) for each level of output.
2. Determine the marginal cost (MC) for each additional unit.
3. At what level of output does the firm maximize profit or minimize loss, given the market price?
4. If the market price falls to \$15, should the firm continue to produce in the short run? Explain why or why not.

**Long-Run:** A purely competitive industry is currently in long-run equilibrium, with each firm producing at its minimum average total cost (ATC) of \$25 and selling its product at the market price of \$25. Each firm in the industry is earning zero economic profit.

1. Suppose there is an increase in market demand, which raises the market price to \$30. Describe what will happen in the short run to existing firms and to the overall market.
2. What will happen in the long run in response to the new market price of \$30? Explain how entry or exit of firms affects the supply curve, price, and profits.
3. Describe the conditions under which the industry would be classified as a constant-cost, increasing-cost, or decreasing-cost industry.