Pure Competition Notes

- Information from earlier chapters will now become important for understanding how supply decisions are made (how product prices and quantities are set):
  - Total revenue from the chapter on elasticity.
  - Costs.
- How each firm makes such decisions depends heavily upon the type of industry they are producing in. But there are an unlimited variety of market structures.
- At one extreme is perfect competition. While few (if any) industries resemble perfect competition, the model does serve a purpose:
  1. Some industries come closer to this structure than to any other. So the model is useful for understanding these market. (In particular agricultural markets such as wheat and rice.)
  2. It provides us with a norm with which to compare the efficiency of real-world markets.

- Main characteristics:
  1. Large number of firms (and a large number of buyers as well) – all producing on a small scale.
  2. Homogenous product – the product is standardized (identical) with no difference between the products sold by different firms. Consumers will therefore be indifferent about who they buy from.
  3. Firms are “price takers” – they sell their output at prices that are determined by forces beyond their control. Because each firm is so small, it exerts no significant influence on supply. Therefore, it must accept whatever the market price is and determine how much to sell based on that price. (See Figure 22.2)
  4. Free entry and exit – there are no significant obstacles to firms either entering or exiting the market. Note that, in general, we are primarily interested in entry conditions since it is rare for a firm to be unable to exit a market.
  5. Non-price competition (such as advertising) – none, because there is no point. Advertising and such costs money and does not enable them to increase their revenue.

- Although not specifically laid out, in most models economists also assume perfect information. This is just a simplification to understand underlying relationships. In many cases, economists attempt to understand how information affects choices by relaxing this assumption. For the models that follow, however, we will utilize the assumption of perfect information.

- Since each individual firm is a “price taker,” they can sell as much as they want at the market price. It is so small relative to the market as a whole that its decisions do not significantly affect the market price.
  - Therefore, although the demand curve for the market as a whole is a downward-sloping curve, the demand curve facing each firm is perfectly elastic (a horizontal line). (See Figure 22.2)
In the special case of perfect competition, \( D = MR = AR = P \).
- Since price must be taken as given and the firm can sell as much as they want at that price, demand (\( D \)) equals price (\( P \)) (i.e. it is a horizontal line at the market price).
- Since each unit is sold for the same price, average revenue (AR) also equals price (\( P \)).
- Finally, since each additional unit is sold for the same price, marginal revenue (MR) also equals price (\( P \)). Remember that marginal revenue means additional revenue.
  - Marginal revenue is the additional revenue associated with a one-unit increase in the quantity sold.

In the short-run, firms must decide how much to produce. There are two approaches that yield identical outcomes:
1. The total revenue (TR) / total cost (TC) approach; and
2. The marginal revenue (MR) / marginal cost (MC) approach.

Total revenue (TR) – total cost (TC) approach:
- Profit = TR – TC, where costs include both implicit and explicit costs. Negative profits are termed losses.
  - Total revenue is simply price times the quantity sold.
  - Since price is constant for the perfectly competitive firm is upward-sloping with a slope equal to the equilibrium price. (See Figure 22.3)
  - Remember that fixed costs must be paid regardless of how much a firm produces (and even if they produce nothing at all). But variable costs are only incurred with production and go up as output goes up.
  - Also remember that out total cost (TC) curve first goes up at a decreasing rate (due to initially increasing marginal returns) and then begins to increase at an increasing rate (once diminishing marginal returns kicks in). (See Figure 22.4)
  - When TC exceeds TR, there are losses. When TR exceeds TC, there are profits. (See Figure 22.5)
    - The firm wants to maximize the difference between TR and TC to maximize their profits.
    - Determining this point is easiest using the MR/MC approach.
      - Note that this is a version of our key choice equation (marginal benefit = marginal cost). Here the marginal benefit is marginal revenue.

Marginal revenue (MR) = marginal cost (MC) approach:
- Marginal revenue is the slope of the total revenue curve. Marginal cost is the slope of the total cost curve. Where the two are equal, the distance between total revenue and total cost is greatest (i.e. profit is maximized).
- Remember that we saw this earlier in the context of allocative efficiency and the production possibilities curve.
- Profits are maximized (losses are minimized) at this point of intersection. However, this is only relevant if the firm chooses to produce.
When the actual point of intersection involves fractional levels of output, we will use the last unit for which MR exceeds MC.

The MR=MC rule applies to all types of firms, not just perfectly competitive firms.
- However, since MR=P for perfectly competitive firms, this rule becomes P=MC in this special case.

Using our general rule, we will want to increase production as long as MR>MC. We will want to decrease production as long as MR<MC. And we will want to maintain our output whenever MR=MC. (Remember that in this special case, MR=P.) (See Figure 22.7 for how this works graphically.)

The profit on each unit is equal to the price the unit sold for minus the average cost of each unit. To determine total profit, multiply the profit per unit by the quantity sold. (See Figure 22.8)
- Basically, once you have determined the quantity the firm will produce, multiply that quantity by the difference between ATC and P at that quantity.

Profit-maximizing case:
- As long as Price is greater than ATC for the amount of output produced (Q), a firm will make a profit on each unit. (See Figure 22.9A)

Loss-minimization case:
- If Price is lower than ATC for the amount of output produced (Q), the firm will be making a loss. Then it is a matter of determining whether to produce at a loss or shut down.

Shut-down decision:
- When a firm does not produce, the only costs incurred are fixed costs.
- If price is low enough, it is possible for losses to be minimized by not producing.
- A firm should shut down only if the losses from continuing production exceed fixed costs.
  - This happens when total revenue (TR) is less than total variable cost (TVC).
  - In a per-unit context, this becomes when price (P) is less than average variable cost (AVC). So when P<AVC for the quantity the firm would produce (MR=MC), the firm should shut-down.
- Figure 22.9B shows a situation where the firm continues to operate at a loss.
- Figure 22.9C shows a case where the firm shuts down and incurs only fixed costs in the short-run (SR).
- The shut-down point occurs where P=AVC. At this point, a firm would be indifferent between producing and not producing. Economists generally assume that they produce when indifferent.
• The short-run supply curve above the shutdown point is the supply curve for an individual perfectly competitive firm. (See figure 22.10)
  • Determinants of supply shift the SR supply curve.

Short-run competitive equilibrium:
  • As we discussed earlier in the class, the market supply curve is made up of all individual firm supply curves. (See Figure 23.1)

Long-run profit maximization (remember that with a perfectly competitive industry, there are no barriers to entry):
  • In the long-run, firms can enter or leave an industry. They can also expand or shrink capacity, but we will focus on entry and exit.
  • Firms seek profits and shun losses.
    • If there are short-run profits, in the long-run firms will enter an industry until these profits are eliminated.
      • If there are profits, firms enter the industry, increasing market supply and driving down price. This lowers profits. Profits will continue to fall until there is no longer any incentive for firms to enter the industry (i.e. no economic profit remaining).
    • If there are short-run losses, in the long-run firms will exit an industry until these losses are eliminated.
      • If there are losses, firms exit the industry, decreasing market supply and driving up price. This increase profits (or more accurately, lessens losses). Profits will continue to rise until there is no longer any incentive for firms to exit the industry.
  • In the long run (LR), economic profits in a perfectly competitive industry will equal zero (remember that this still allows for accounting profits and a return on entrepreneurial investment).
  • In the long-run, equilibrium will resemble Figure 23.6B in the book, with price equal to minimum average total cost and there will be zero economic profits.
    • At long-run competitive equilibrium, \( P = MC = \min ATC \).
    • If \( P > ATC \) there are profits and firms should enter.
    • If \( P < ATC \) there are losses and firms should exit.
    • If \( P = ATC \), firms are earning zero economic profit and there is no tendency for change.

Efficiency of pure competition:
  • Pure competition is productively efficient.
    • Productive efficiency requires that \( P = \min ATC \).
    • Firms must use the least-cost (best available) production methods and input combinations to survive.
    • Note that consumers benefit by paying the lowest possible price under the prevailing technology and cost structure.
  • Pure competition is also allocatively efficient.
    • Remember that allocative efficiency requires that the goods that society wants are produced. (\( MC = MB \))
- Under pure competition, P=MC.
- P reflects the MB of that good (what individuals are willing to pay for it).
- If P>MC, there is an underallocation of resources into the production of that good.
- If P<MC, there is an overallocation of resources into the production of that good.