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Introduction to Market Structures

Product markets come in many forms. The four market structures are introduced below.

Characteristic	Pure (or Perfect) Competition	Monopolistic Competition	Oligopoly	Monopoly
Number of Firms	VERY large number of firms	Fairly large number of firms	A few large firms dominate an industry	Only ONE firm. The firm IS the industry
Price making abilities of individual firms	Each firm is so small that changes in its own output do not affect market price, i.e. firms are price takers	Firms are small relative to the industry, meaning changes in one firms output have only a slight impact on market price	A change in one firm's output has significant impact on the market price, firms are price-makers.	Changes in the firm's output cause changes in the price, i.e. the firm is a price-maker!

Type of product	Firms all produce identical products, with no differentiation	Products are slightly differentiated. Firms will advertise to try and further differentiate product. Branding! Advertising!	Products can be identical (such as oil) or differentiated (such as Macs and Dells) Firms will likely use advertising to try and differentiate their products from competitors'	Unique product, no other firm makes anything like it.
Entry barriers	Completely free entry and exit from the industry, i.e. NO barriers to entry.	Limited barriers to entry, firms can enter or leave easily	There are significant barriers to entry	Significant barriers to entry exist, preventing new firms from entering and competing with the monopolist

Assumptions of the Perfectly Competitive Market Model

To begin our studies of competition in different markets, we will examine the perfectly competitive market model.

A perfectly competitive market is one in which:
- There is a very large number of firms,
- Selling identical products to one another,
- In which there are no barriers to entry or exit
- And in which individual firms have no control over the market price.

Example: Imagine you live in New York City and want to have a cheese pizza for lunch. Let's assume…
- There are hundreds of pizza shops in New York
- Every one of them has cheese pizza on their menu
- They all pay their workers minimum wage. They all buy cheese, dough and tomato sauce at the same prices
- It is cheap and easy to open a pizza shop, just as it is to shut one down if needed.

Based on these characteristics, the market for cheese pizzas in New York is close to perfectly competitive. You will pay

the same price no matter where you order your pizza!

Perfectly Competitive Firms are "Price Takers"
An individual firm in a perfectly competitive market has no control over the price of its own output.
This is because the price is determined based on *market supply* and *market demand.*

Note from the graph below that:
- The demand seen by the firm is determined by the price in the market.
- Price also determines the firm's marginal revenue
- The firm has no "price-making power" because if it raises its price, it will sell no output, and
- If it lowers its price, it will not be able to cover its costs of production.
- Demand for the individual firm's output is perfectly elastic
- To maximize its profits, a firm should produce where its marginal revenue equals its marginal costs.
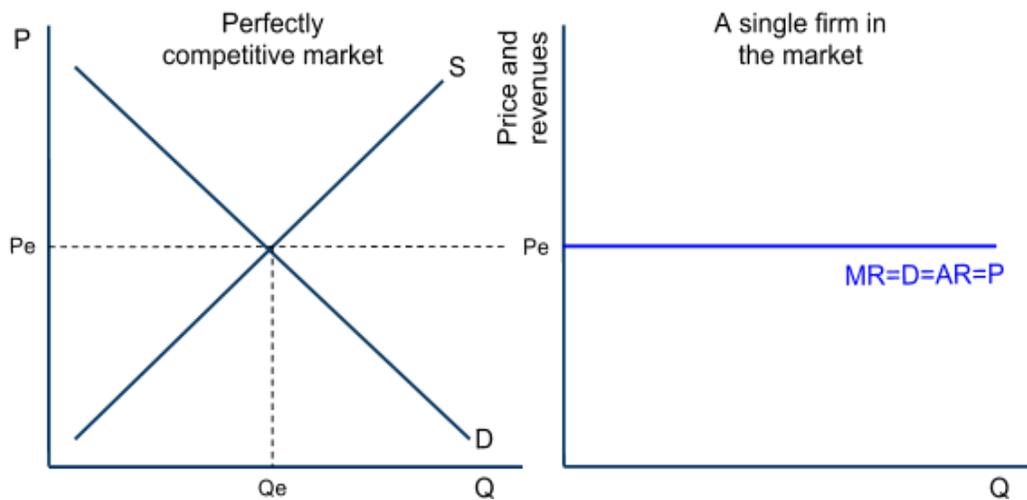
Profit Maximization for the Perfect Competitor
In our previous unit we learned that, to maximize its economic profits at any given time, a firm should produce at the quantity at which its marginal revenue (MR) equals its marginal cost (MC)

In the graph below:
- The firm is facing marginal revenue equal to Pe, determined by the market price at any given time.
- The firm's marginal cost increases steadily due to diminishing returns (to make more pizzas in the short-run, more cooks must be hired, but because capital is fixed the marginal product of cooks decreases as more are added)
- Based on its MC and MR, the firm will maximize its profits (or minimize its losses) by producing at Qf
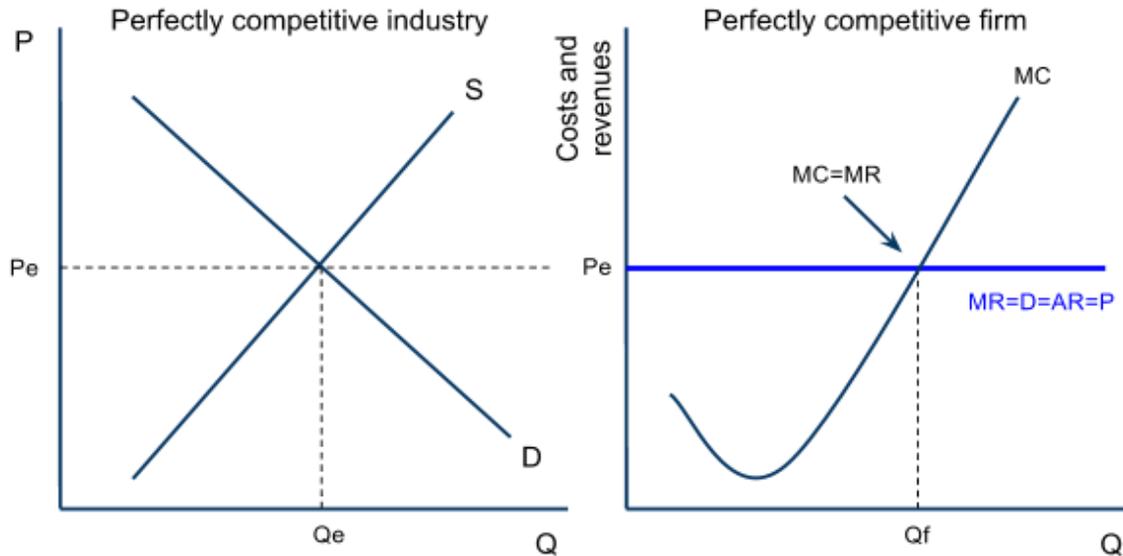
Determining Short-run Economic Profits or Loss
A firm will maximize its profits (or minimize its losses) by producing at the quantity where MR=MC. To determine whether a firm is actually earning profits, breaking even, or earning losses at this quantity, we must consider both the firm's average revenue (the price) and its average total cost.

Short-run Costs of Production: Recall from our earlier unit that a firm faces the following short-run production costs:

- Marginal Cost, which slopes upwards because of diminishing marginal returns
- Average variable cost, which is the per unit labor costs of production
- Average total cost, which is the average variable costs plus the average fixed costs (the per-unit costs of fixed capital resources)
- Recall also that MC must intersect the average cost curves at their lowest points.
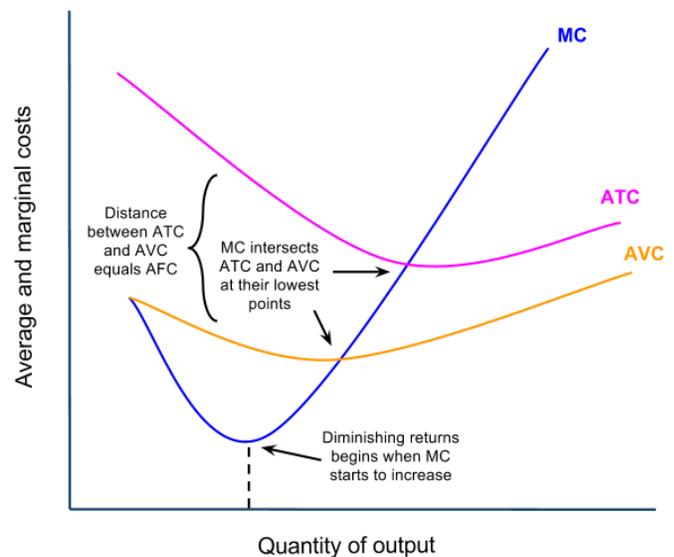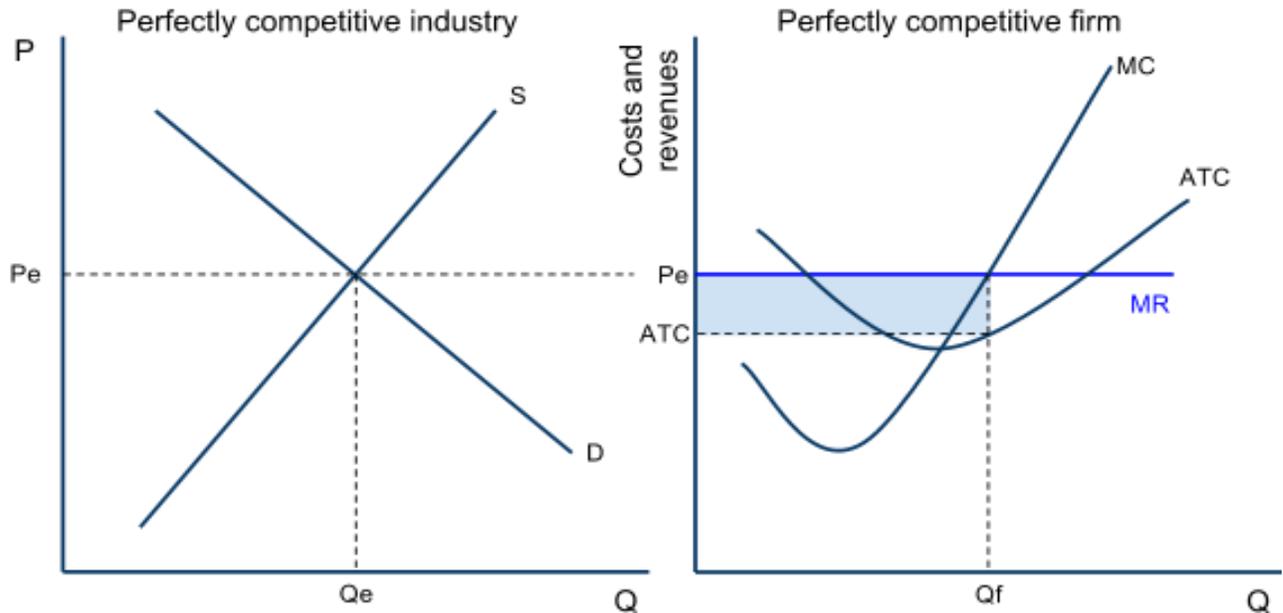
Profit Maximization in the Short-run: The Profit-earning Firm
If, when producing at its MC=MR point, a firm in a perfectly competitive market is selling its output for a price that is greater than its average total cost, then the firm is earning economic profits. Economic profits mean the firm is covering all of its explicit and implicit costs, and is earning additional revenue beyond these as well.

Study the graph below and note:
- The market demand is relatively high, presenting firms with a price that is greater than their ATC

- The firm's economic profits are represented by the shaded rectangle (P-ATC)xQ.
- The firm is maximizing its profits by producing where MR=MC.
- Due to the absence of entry barriers, these profits will not be sustained in the long run, as new firms will enter the market.
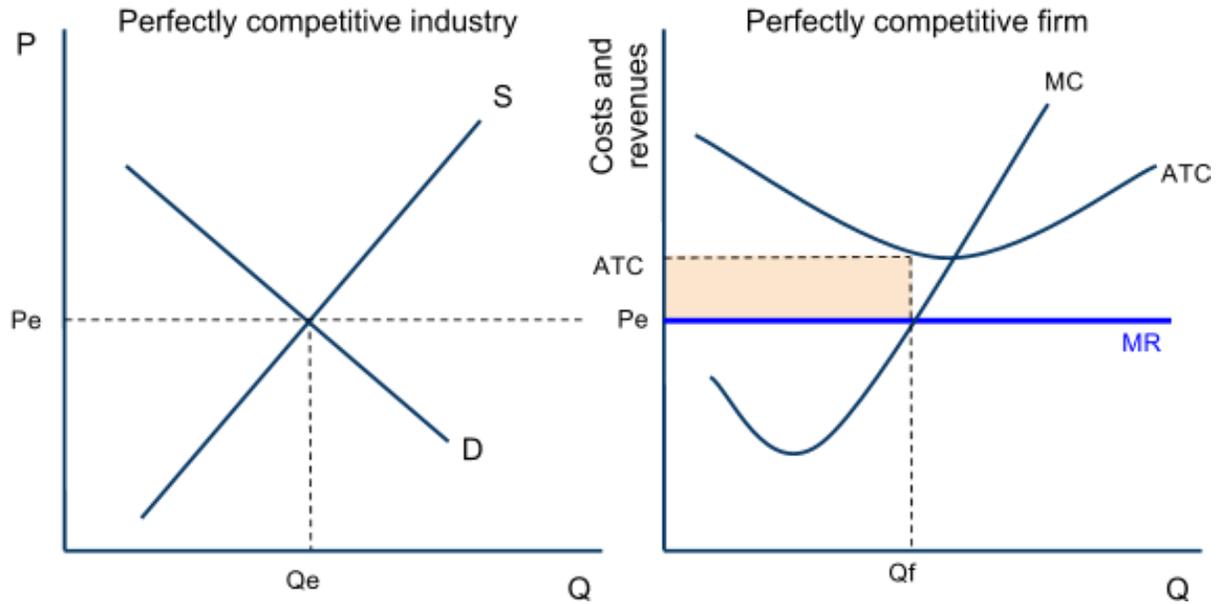

Profit Maximization in the Short-run: The Loss-minimizing Firm

If, when producing at its MC=MR point, a firm in a perfectly competitive market is selling at a price that is lower than its average total cost, the firm will be minimizing its losses, but earning no economic profit at all. The loss-minimizing firm will either exit the industry in the long run, or hope other firms exit until the supply decreases, causing the price to rise once again.

Study the graph below and note:

- The market demand is relatively low, so the price the firm can sell its output for is below its average total cost
- The firm's economic losses are the shaded area (ATC-P)xQ.
- The firm is minimizing its losses by producing where MR=MC.
- Due to the absence of entry barriers, these losses will be eliminated in the long run as firms exit the industry to avoid further losses.

Profit Maximization in the Short-run: The Breaking-even Firm

If, when producing at its MC=MR level of output, the price the firm can sell its output for is exactly equal to the firm's minimum average total cost, then the best the firm can hope to do is to break even. Breaking even means a firm is covering all of its explicit and implicit costs, but earning no *additional* profit. The firm is earning only a **NORMAL PROFIT**.

Study the graph below and note:
- The market demand and supply have set a price equal to the firm's minimum average total cost.
- The firm is just covering all its costs, meaning it is earning zero economic profits, but no losses
- If the firm produced at any quantity other than Qf, it would earn economic losses. By producing at Qf, it is breaking even.
- There is no incentive for firms to enter or exit this market.
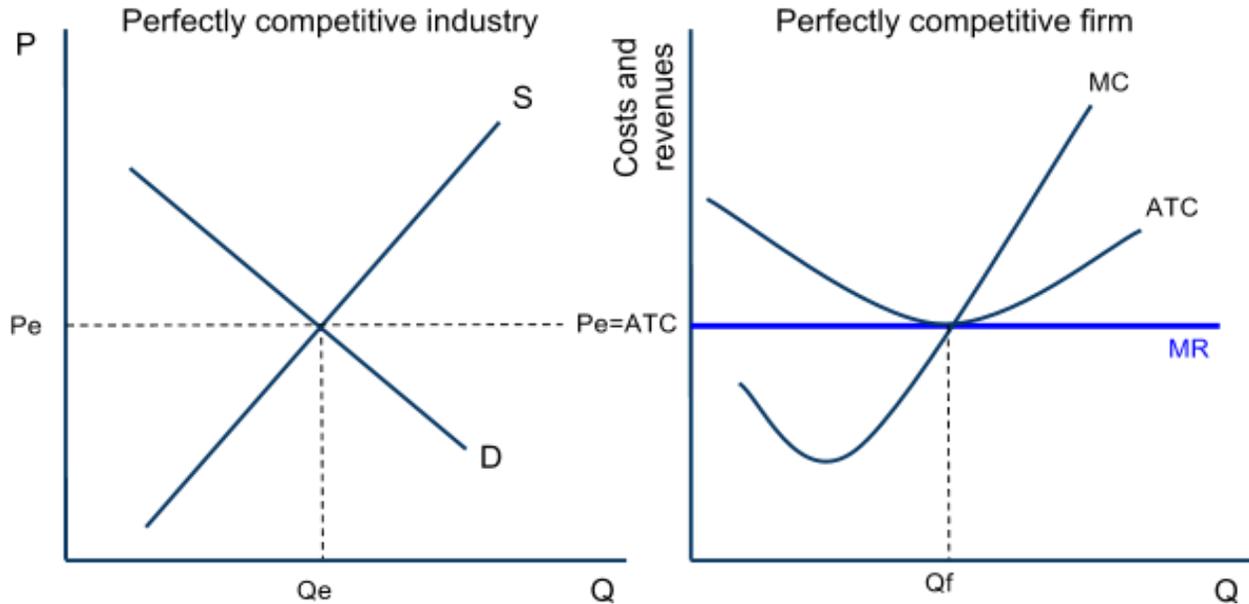
Profit Maximization in the Long run
Recall from an earlier unit that the long run is defined as: The period of time over which firms can adjust their plant size in response to changes in the level of demand for their product. New firms can enter a market and existing firms can exit a market in the long run. The long run is the variable-plant period.

Entry and exit in the long run: In perfectly competitive markets, firms can enter or exit the market in the long run.
- If economic profits are being earned, firms will be attracted to the profits and will want to enter the market
- If economic losses are being earned, some firms will wish to minimize their losses by shutting down and leaving the market
- Due to the entry and exit of firms in perfectly competitive markets, economic profits and losses will be eliminated in the long run and firms will only BREAK EVEN.

When all the firms in a perfectly competitive market are breaking even, a market is in its long-run equilibrium state. No firms will wish to enter OR exit a market in which firms are breaking even!

Profit Maximization in the Long run – Entry Eliminates Profits
When individual firms are earning economic profits in a perfectly competitive market, new firms will be attracted to the market, leading to an increase in market supply and a fall in the price.

Consider the pizza market on the next page:
- At the current level of demand and supply, the price ($20) per pizza is greater than the typical firm's ATC ($16).
- Pizza shops are making 200 pizzas each at a profit of $4 per pizza for a total profit of $800.
- Due to the low entry barriers, sellers of other products will be attracted to the pizza market,

where easy profits can be earned.
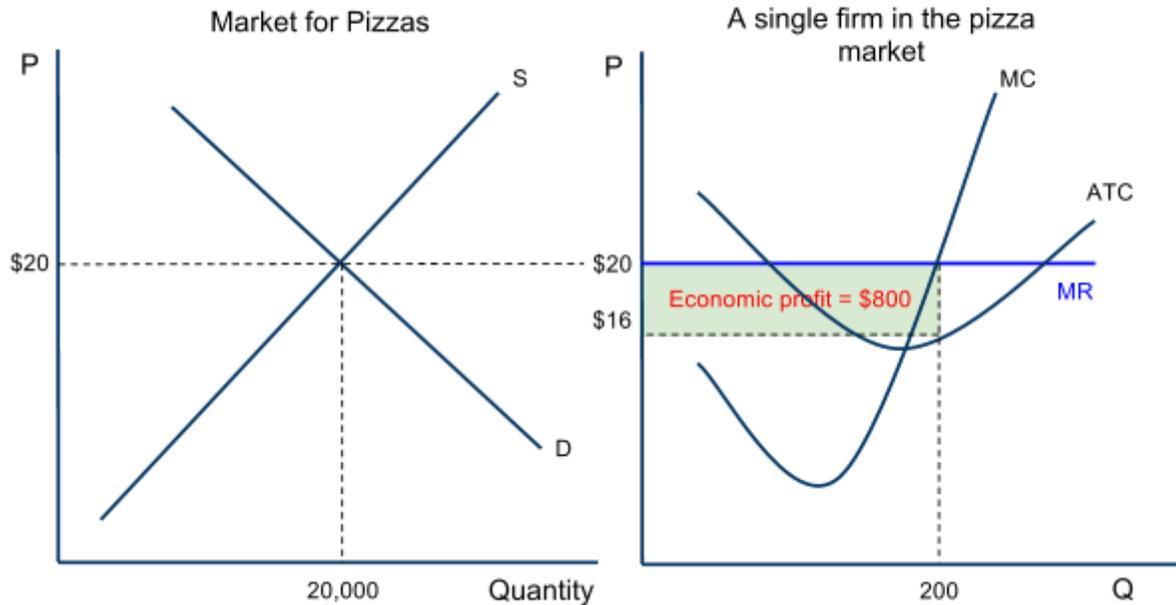
The existence of economic profits will attract new sellers to the pizza market.
- The number of sellers is a determinant of supply, so the market supply will increase
- The increased competition in the pizza market causes the price of pizzas to fall and the market quantity to increase

For the individual firm in the market:
- The price of pizza falls from $20 to $15.
- MR falls, causing the firm to reduce its output to maintain its MR=MC level
- Economic profit is eliminated, as the price falls to the firm's minimum ATC
- The firm's output is reduced as it now faces more competition
- *The market is in equilibrium again when the individual firm is only breaking even*

Market for Pizzas — A single firm in the pizza market
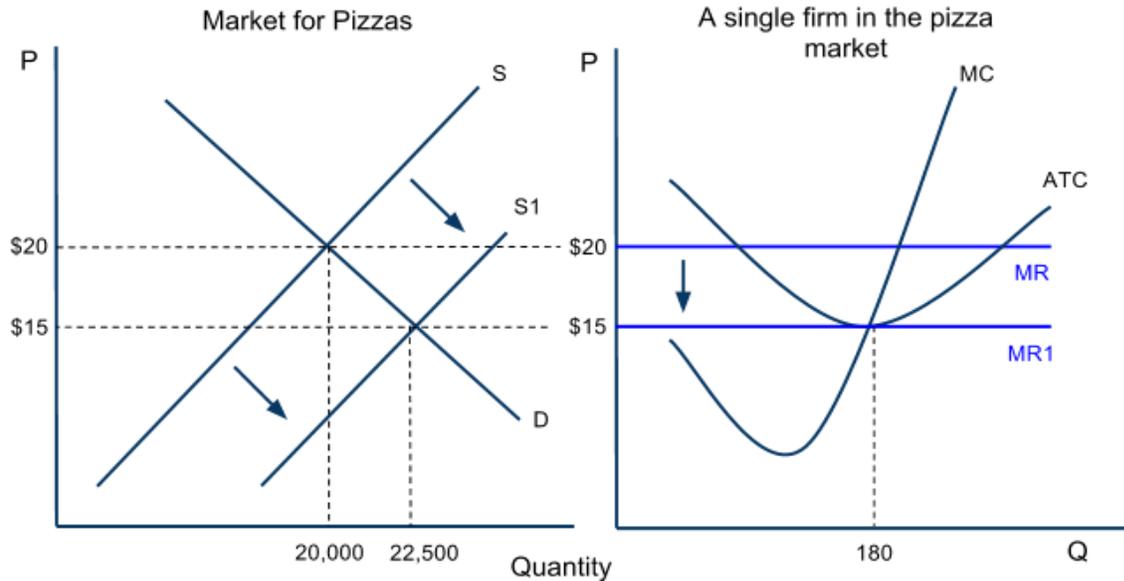
Profit Maximization in the Long-run – Exit Eliminates Losses

When individual firms are earning losses in a perfectly competitive market, certain firms will choose to leave the market to avoid losses and to seek profits elsewhere.

Consider the pizza market:
- At the current level of demand and supply the market price ($12) is lower than the typical firm's ATC ($16)
- Pizza shops are making 180 pizzas each at a loss of $4 per pizza, for a total loss of $720
- Due to the fact that it is easy to exit the market, some pizza shops will chose to shut down and seek profits elsewhere.

Market for Pizzas — A single firm in the Pizza market
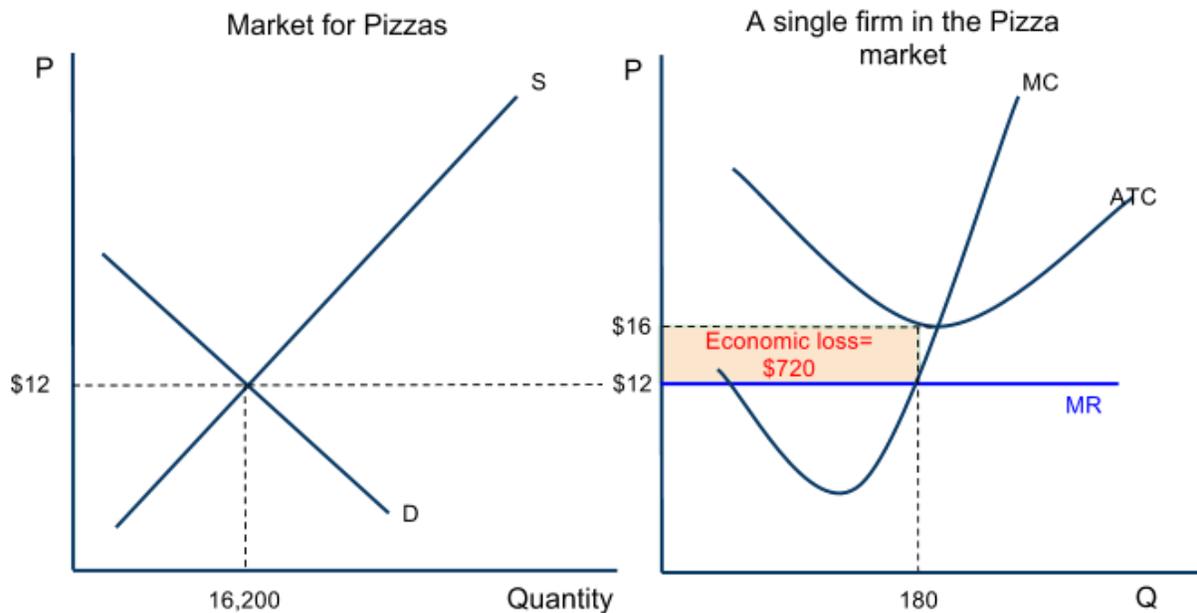
The experience of earning losses will make some firms wish to leave the market
- The number of sellers is a determinant of supply, so the market supply will decrease
- The decreased competition in the pizza market causes the price of pizzas to rise and the market quantity to decrease

For the individual firm that remains in the market:
- The price of pizza rises from $12 to $15
- MR rises, causing the firm to increase its output to maintain its MR=MC level
- Losses are eliminated, as the price rises to the firm's minimum ATC
- The firm's output increases as it now faces less competition
- *The market is in equilibrium again when the individual firm is only breaking even*
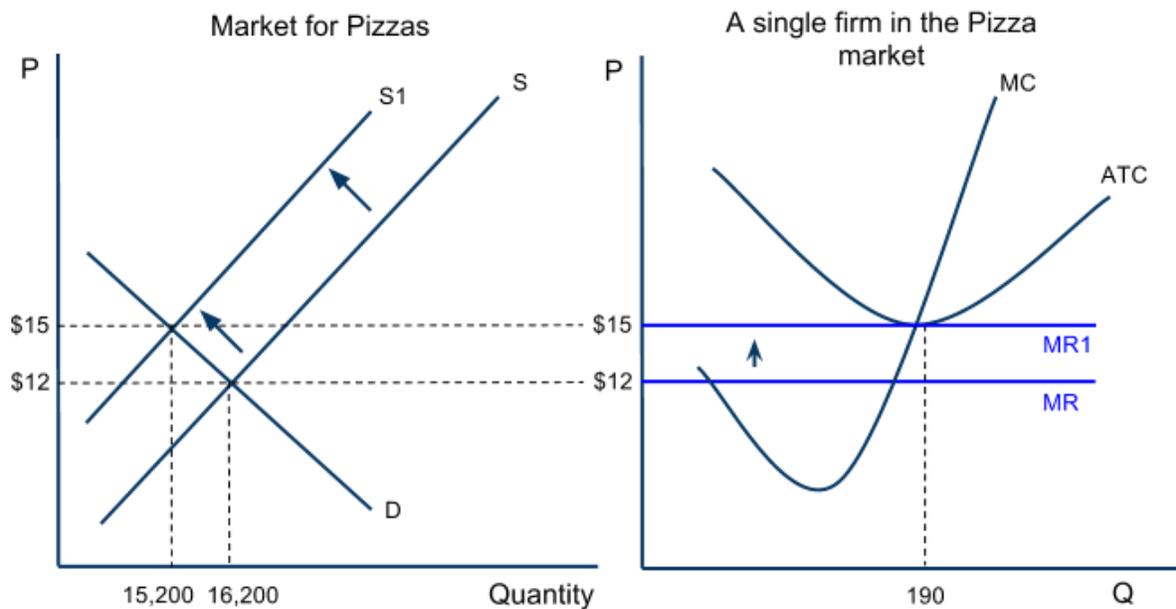
Long-run Equilibrium in Perfect Competition
A perfectly competitive market is in its long-run equilibrium ONLY when the typical firm is breaking even.
- Equilibrium is defined as "*a state of balance*"
- If any profits or losses are being earned, a PC market is out of balance, and firms will enter or exit the market until equilibrium is restored.
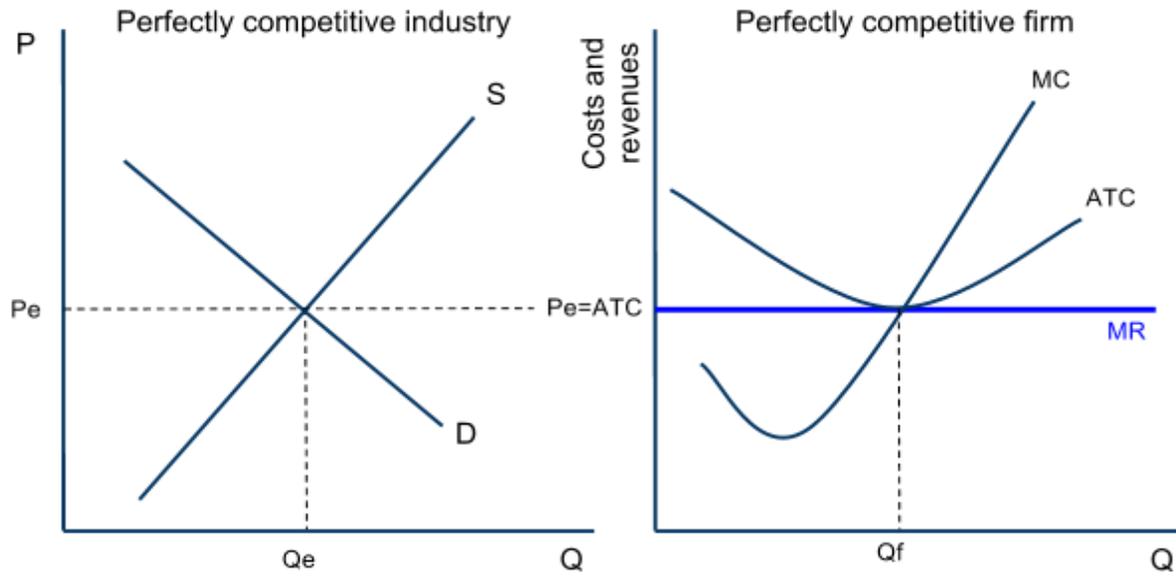
The Shut-down Rule
So far we have said that "if losses are being earned, some firms will exit the market until the remaining firms are breaking even once again". But this raises the question: *Which firms will exit the market, and which firms will stay?*

Revisiting our assumptions about perfect competition: Recall that we said that PC firms face identical costs of production. That is not 100% true, because one cost, the level of *normal profit,* can vary from seller to seller, even in perfect competition.

Normal profit is the implicit, subjective value of each business owner's skills and time. Some business owners will value their efforts more highly than others, even when all the other costs faced are identical to all other business owners' costs.
  • For this reason, some sellers will be willing to tolerate greater losses for longer periods of time than other sellers.
  • In other words, among firms facing identical *explicit costs* (wages, interests, rents), some will shut down sooner when earning losses than others due to their different levels of *implicit costs* (normal profit)

A firm facing economic losses has two choices:
  1. Continue to operate your business, and hope that your average revenue (price) is at least high enough to cover your average variable costs (these are your operating costs in the short-run… you have to earn enough to pay your workers, at least!), OR…
  2. Shut down and give up your fixed costs, which are those that must be paid EVEN if you shut your business down. A firm's loss when it shuts down is its total fixed costs, those payments to owners of capital and land resources (rent for your landlord, interest owed to the bank on money you borrowed to buy capital).

These tradeoffs give business owners a clear rule for WHEN TO SHUT DOWN:

If the price of your product is lower than a firm's average variable cost
or…
If the firm's total losses when continuing to operate are greater than its total fixed costs

If either of these criteria are true, then a firm *can always minimize its losses by shutting down and leaving the market.* If neither is true, the firm should remain in the market and continue to produce, and hope that the price rises again in the future.

A firm facing losses must compare its level of losses by continuing to operate to its level of losses if it shuts down.
- Total losses if it continues to operate = *(AR-ATC)×Q*
- Total losses if it shuts down = *(ATC-AVC)×Q*

Consider the Pizza Market:
- The demand for pizzas is so low that the price ($10) is lower than the firm's AVC ($11). The firm cannot even afford to pay its workers.
- The firm's total losses (17-10)x160, are greater than its total fixed costs (17-11)x160. The firm would minimize its losses by shutting down
- This firm should exit the market
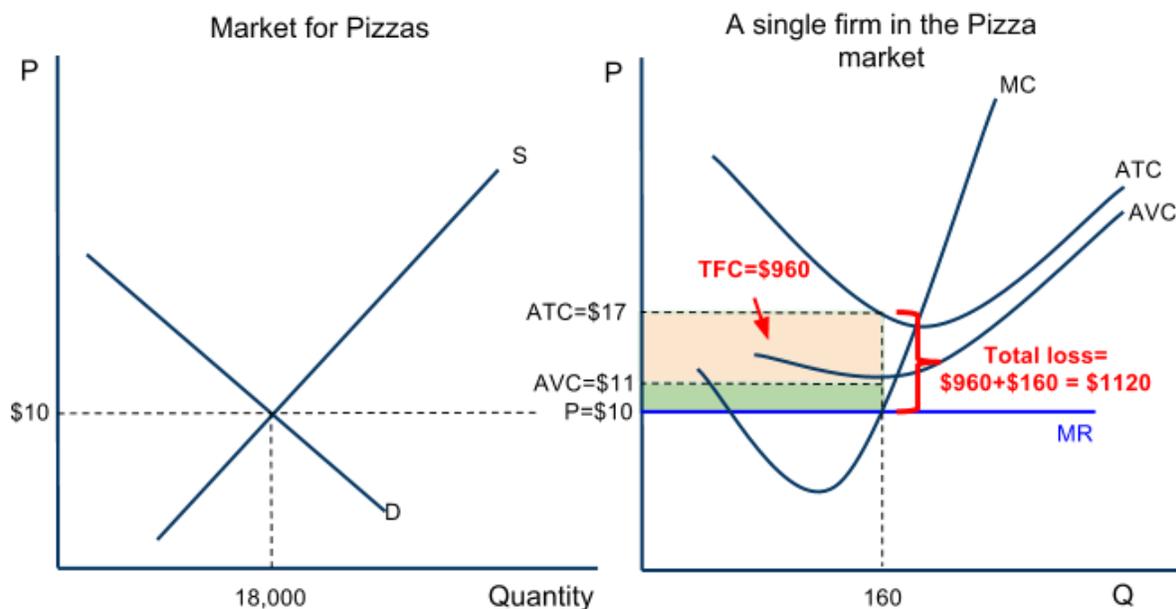
Efficiency in Perfectly Competitive Markets
In long-run equilibrium, purely competitive firms will produce the *efficient level of output and price.* Efficiency in economics is measured in two ways: Firms can be *productively efficient* and an industry can be *allocatively efficient.*

Productive Efficiency is achieved if firms produce at their *minimum average total cost:*

- Interpretation: *Firms are using resources to their maximum efficiency by producing their output at the lowest possible average total cost. Competition forces firms to use resources as efficiently as possible.*

Allocative Efficiency is achieved if a market produces at the quantity where marginal benefit equals marginal cost (where Price = Marginal Cost)
- Interpretation: *The right amount of output is being produced. There is neither under nor over-allocation of resources towards a good in a purely competitive industry.*
  - ➤ If the price were higher than the marginal cost, this is a signal that marginal benefit exceeds marginal cost and more output is desired,
  - ➤ If price were lower than marginal cost, the signal from buyers to sellers is that marginal cost exceeds marginal benefit and less output is desired.
 - ➤ Only when P = MC is the right amount of output being produced.

Productive Efficiency
Price acts as a signal in competitive markets of the demands (and therefore the marginal benefit) of consumers. Price will always equal firms' minimum ATC in the long-run, assuring that perfectly competitive sellers will be productively efficient.
- If price is high enough that firms are earning profits, then the signal from buyers to sellers is *WE WANT MORE*
- If price is low enough that firms are earning losses, then the signal from buyers to sellers is *WE WANT LESS*

Consider the market and firm here:
- Price is higher than the firm's ATC.
- The firm's are earning economic profits
- The signal from buyers is "we want more", so more firms will enter the market to satisfy demand.
- As new firms enter, price will fall to minimum ATC, and firms will be *more **productively efficient!***
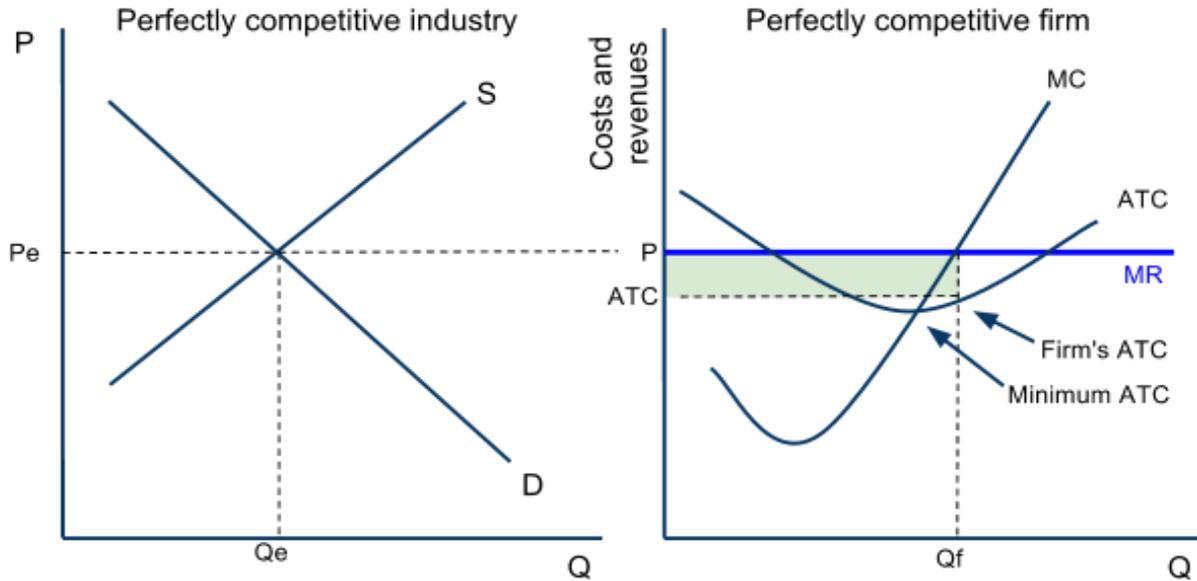
Study the graphs here:
- Assume the firm (which represents *all firms in this market*) produces at Q1.
- Market quantity supplied will be only Qs. At Qs, the demand (MB) is greater than the supply (MC) of the good. *Resources are under-allocated.*
- The profit-maximizing firm will increase its production to Qf to achieve the MR=MC point.
- As all firms do so, market quantity increases to Qe.
- *When all firms produce where P=MC, the shortage that existed at Qs is eliminated and resources are efficiently allocated toward this good*
  •