BUEC 311: Business Economics, Organization and Management
Perfect Competition

Fall 2020

Outline

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Perfect Competition

- Perfect competition is a market structure in which buyers and sellers are all price takers.

Definition (Price Taking)

A firm or consumer is a *price taker* if they cannot affect the market price for a product.

Perfect Competition

- Perfect competition is characterized by five key features:
  1. Large number of buyers and sellers.
  2. Identical products.
  3. Full information.
  4. Negligible transaction costs.
  5. Free entry and exit.

Feature 1 - Many Buyers and Sellers

- If there are a large number of sellers in the market, no single firm can unilaterally raise or lower the market price.
- Similarly, if there are a large number of buyers in the market, no single customer can influence the market price.
- Why?

Feature 2 - Identical Products

- Buyers perceive that all firms sell identical or *homogeneous* products.
- Why can't products be differentiated?

Feature 3 - Full Information

- Buyers know the prices charged by all firms and that products are identical.
- What happens if buyers don't know all prices?

Feature 4 - Negligible Transaction Costs

- The cost of completing a market transaction is low.
  - Easy to find a buyer or seller; no need to hire lawyers to write contracts before making a trade.
- What happens if transaction costs are high?

Feature 5 - Free Entry and Exit

- Easy entry and exit leads to a large number of firms in the market and promotes price taking.
- Why is this?

Perfect Competition

- Some markets have all 5 features.

- E.g. The Chicago Mercantile Exchange.
  1. Many buyers and sellers.
  2. Trade in identical products.
  3. Full price information.
  4. Low transaction costs.
  5. Anyone can be a buyer or seller.

Perfect Competition

- Many markets only possess some of the characteristics of perfect competition, but market participants still act like price takers.
  - E.g. Zoning laws restrict the number of motels in a city, but there are still many sellers that act like price takers.

- We will use the terms *competition* and *competitive* to refer to markets where no buyer or seller can significantly alter the market price.
  - That is, markets where *all participant are price takers.*

Outline

Competition in the Short Run

- Recall: In the short run, at least one input cannot be varied.

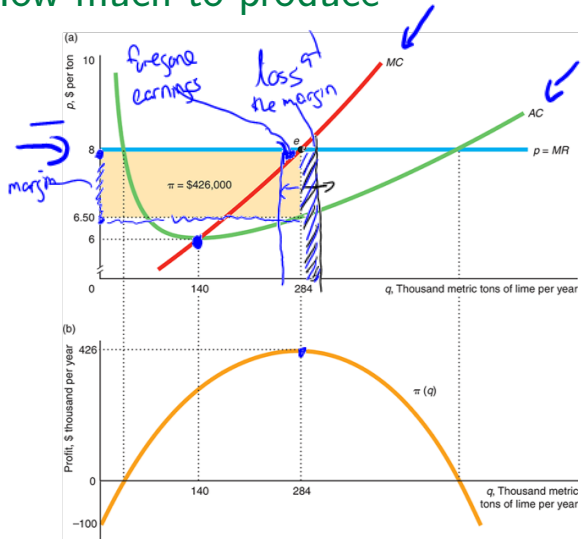
- Production decisions made to maximize profit via 2-step method.
  1. How much to produce: What level of output maximizes profit (or minimizes loss)?
  2. Whether to produce: Should the firm produce or shut down?

Step one: How much to produce

- Recall: To maximize profit, choose q such that $MR(q) = MC(q)$.
- With perfect competition, each firm is a price taker, meaning it effectively faces a horizontal demand curve at the market price p.
- Given $R = p \times q$, this means $MR(q) = p$.
- Hence, with perfect competition, each firm chooses q such that:

$$p = MC(q)$$

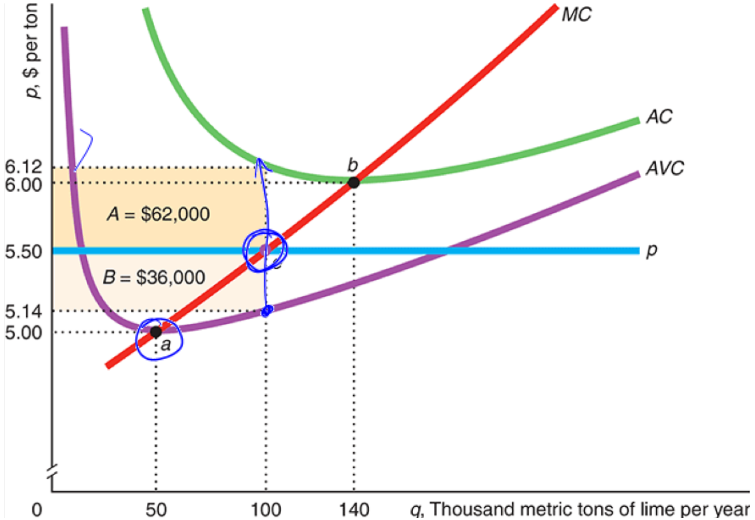
Step one: How much to produce



Step two: Whether to produce

- Recall: Firms should shut down in $R < VC$.
- For a competitive firm, this can be restated as: $p < AVC = VC/q$
- Three possible cases:
  1. $p > AC$: Firm operates with a positive profit.
  2. $AC > p > AVC$: Firm operates with a negative profit.
  3. $AVC > p$: Firm shuts down.

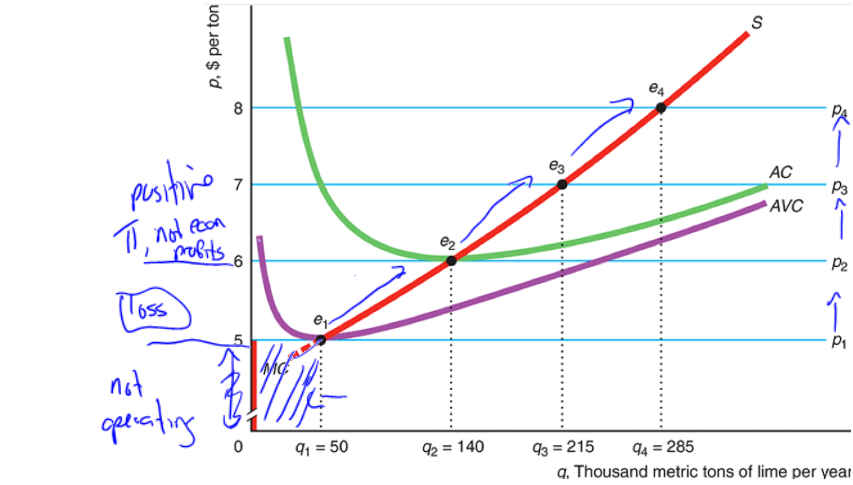
Step two: Whether to produce



Supply in the Short Run

- We can use the shut-down rule to derive the firm's short run supply curve.
- If:
  - $p \geq AVC$, firm produces such that $p = MC(q)$.
  - $p < AVC$, the firm shuts down and produces nothing.
- This means that a competitive firm's short run supply curve is its *marginal cost curve above its minimum average variable cost*.

Supply in the Short Run



Market Supply in the Short Run

- The short run market supply curve is given by the horizontal sum of the supply curves of individual firms.
- The shape of the short run market supply curve depends on the extent of differences across firms.

Market Supply in the Short Run

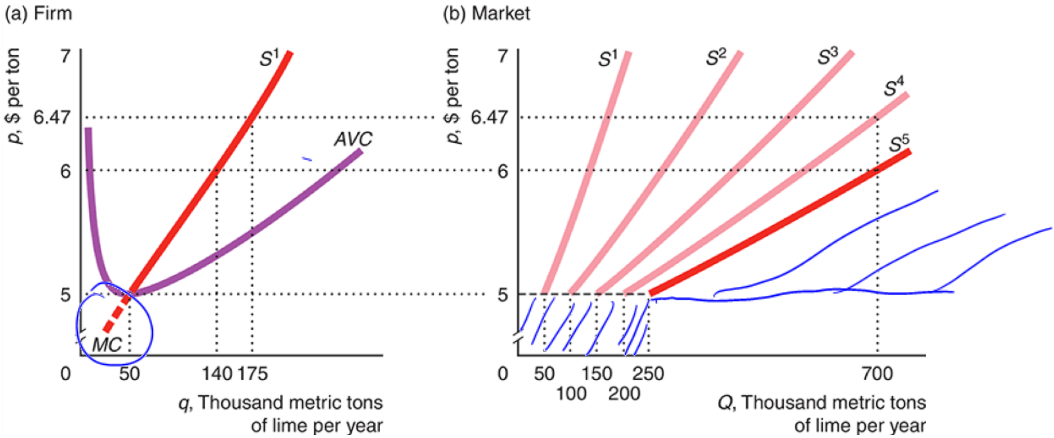


Figure: Market Supply with 5 Identical Firms

Market Supply in the Short Run

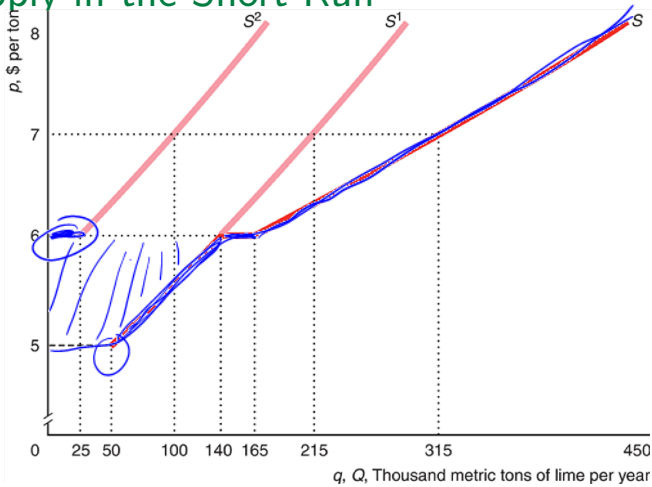
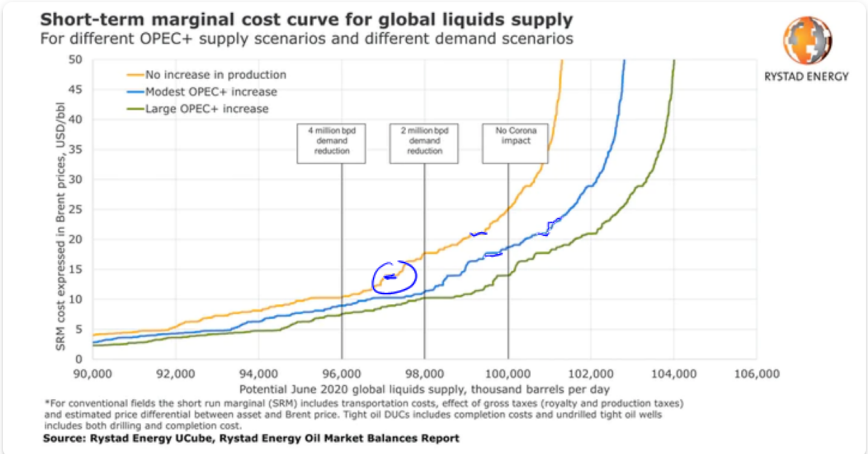


Figure: Market Supply with 2 Different Firms

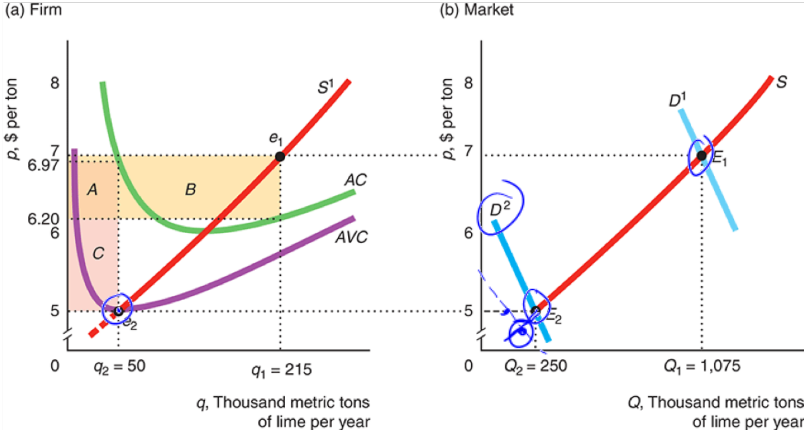
Oil Market Supply in the Short Run



Equilibrium in the Short Run

- We can determine the short-run competitive equilibrium by combining the short run market supply curve with the market demand curve.
- As an example, suppose there are five identical firms in the lime manufacturing industry.

Equilibrium in the Short Run



Outline

Competition in the Long Run

- Recall: In the long run, all inputs are variable.
- Production decisions again made to maximize profit via 2-step method.
- Key difference: long run shut down decision.
  - In the long run, all costs are avoidable, so firm shuts down if it makes an economic loss by operating.

Shut Down Rule in the Long Run

- We can again use the shut down rule to determine the supply curve.
- If:
  1. $p \geq LRAC$: It is profit maximizing to operate.
  2. $p < LRAC$: It is profit maximizing to shut down.
- Thus, in the long run, the supply curve is *the portion of the long-run marginal cost curve that lies above the minimum of the long-run average cost curve*.

Supply in the Long Run

- The long-run market supply curve is again the horizontal sum of the supply curves of the individual firms in the market.
- However, in the long run firms can enter or exit the market.
- Thus, to determine the long-run market supply curve, we need to determine how many firms will be in the market at each possible market price.

Entry and Exit

- The decision to enter or exit depends on whether a firm believes it can make a long-run profit.

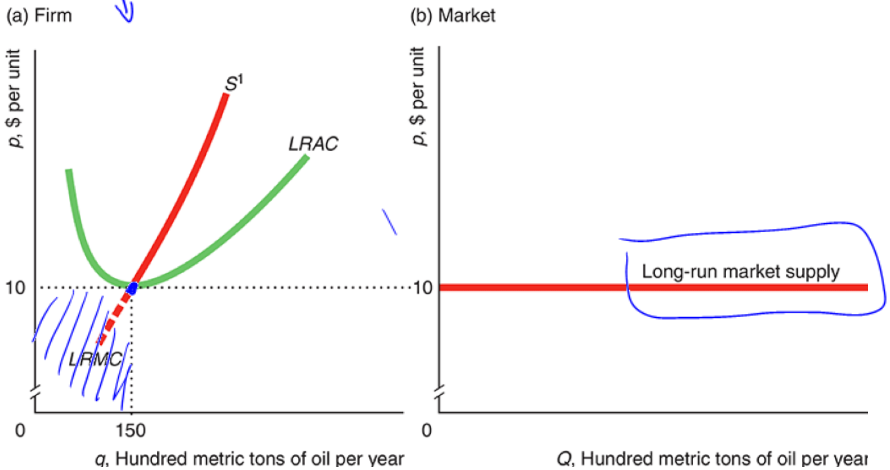
- Any change in demand will lead to a change in the number of firms with free entry and exit.
  - A rightward shift in the market demand curve attracts firms to enter the market until the last firm makes zero long run profit.
  - A leftward shift in the market demand curve forces firms to exit the market until the last firm makes zero long run profit.

Long Run Supply Curve

- The shape of the long-run market supply curve depends on:
  1. Differences across firms.
  2. Ease of entry and exit.

- When firms can freely entry and exit the market, and all firms are identical, the long-run market supply curve is a horizontal line that intersects the minimum of the long-run average cost curve.

Long Run Supply Curve

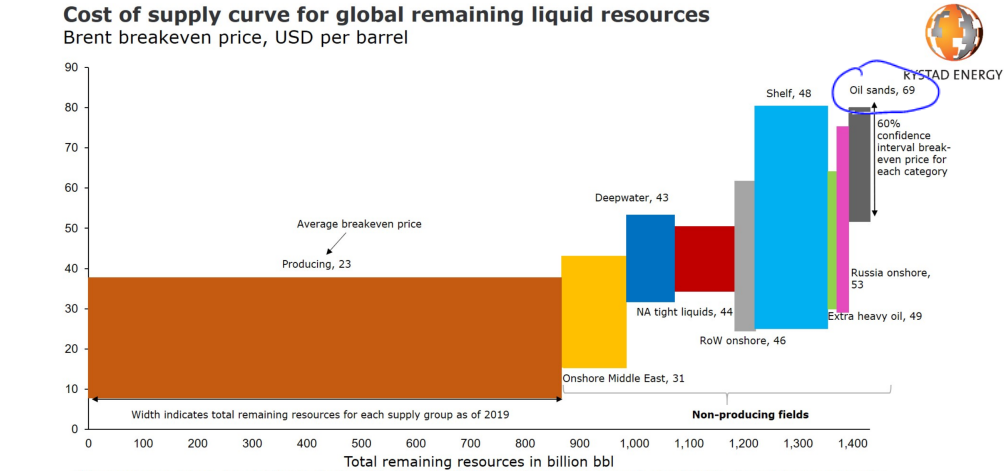


Long Run Supply Curve

- When entry is limited, but firms are identical, *long-run market supply curves slope upward*.
  - This can occur as a result of government restrictions, resource scarcity, or high entry costs.

- When firms are not identical, *long-run market supply curves can be upward sloping*.
  - Firms with relatively low minimum average costs are willing to enter the market at low prices.
  - If these firms cannot serve the entire market due to limited capacity/limited number, then firms with relatively high minimum average costs can enter, leading to an upward sloping supply curve.

Long Run Oil Supply Curve



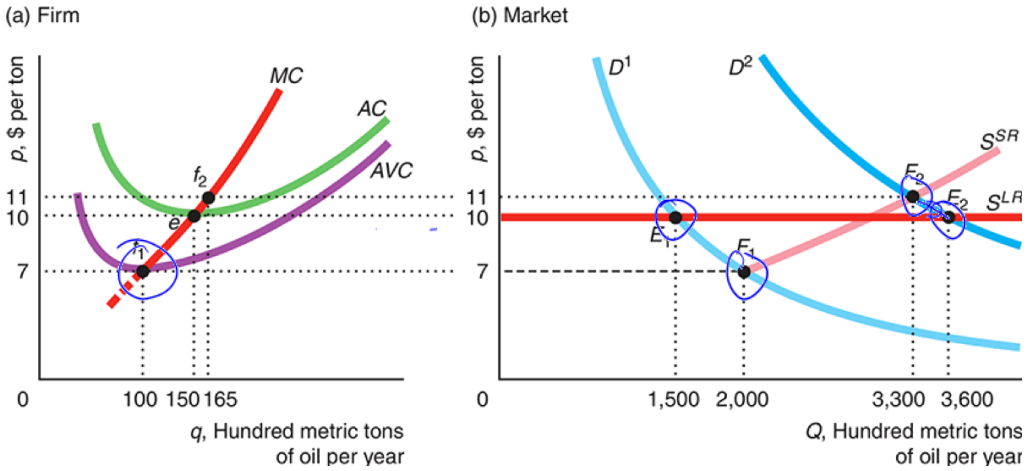
*The breakeven price is the real Brent oil price that gives an NPV of zero given a real discount rate of 7.5%. The breakeven price only includes future costs. The boxes are an average of all fields within each category

Source: Rystad Energy UCube

Long Run or Dynamic Equilibrium

- The long-run competitive equilibrium occurs at the intersection of the long-run market supply and demand curves.
- With identical firms, constant input prices, and free entry and exit, the equilibrium price must equal the minimum long-run average cost.
- In this case, a shift in the demand curve only affects equilibrium quantity but not equilibrium price.

Long Run or Dynamic Equilibrium



Long Run Equilibrium

- The long-run market supply curve is horizontal if firms are free to enter and exit the market, firms have identical costs, and input prices are constant.
- In this case, all firms are operating at minimum long-run average cost.
- This means they are indifferent between shutting down and operating because they are earning zero economic profit.
- Key implication: **To survive in a competitive market in the long run, a firm must maximize its profit.**
  - Firms that fail to maximize profit will be forced to exit.

Outline

Competition and Economic Wellbeing

- The perfectly competitive model describes many aspects of the economy (agriculture, parts of the construction industry, some labor markets, much of retain and wholesale trade) very well.
- The model is also useful as a benchmark for understanding different industries.
- Why?
  - Perfectly competitive markets maximize an important measure of economic well being: total surplus.

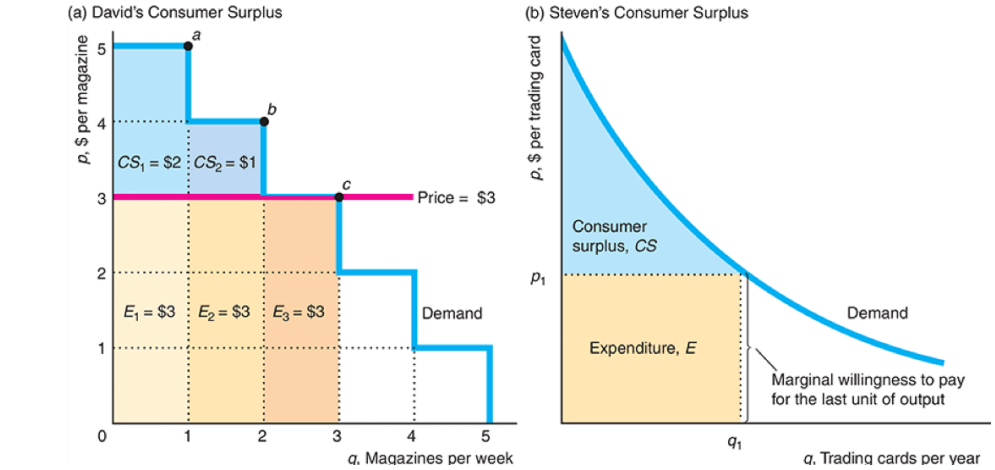
Total Surplus

- Total Surplus (TS) is a monetary measure of the total benefit to all market participants from market transactions.
  - It is a measure of the *gains from trade*.
- Total surplus depends on:
  - The gains for consumers (*consumer surplus*).
  - The gains for producers (*producer surplus*).

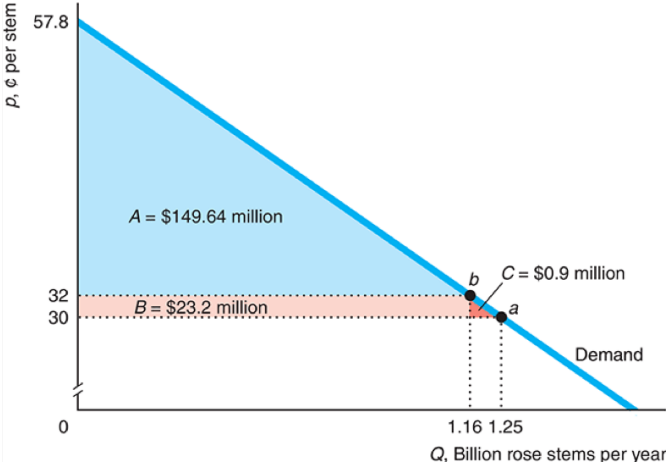
Consumer Surplus

- Consumer Surplus (CS) is the monetary difference between what a consumer is *willing to pay* for the quantity of good purchased and what the consumer actually pays.
  - This is the dollar value of gains from trade for the consumer.
- The demand curve reflects a consumer's marginal willingness to pay.
  - The demand curve reflects the maximum amount a consumer will spend for an extra unit.
- This means we can measure consumer surplus as the area below the demand curve and above the market price up to the quantity actually consumed.

Consumer Surplus



Consumer Surplus

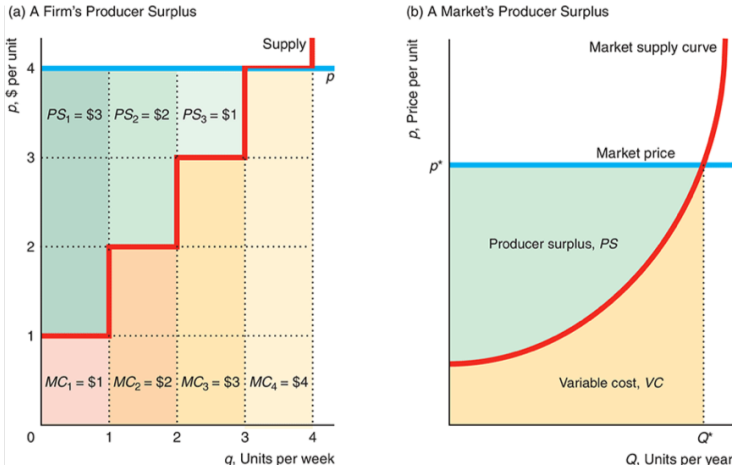


Producer Surplus

- Producer Surplus is the monetary difference between the amount a good sells for, and the minimum amount necessary for the producers to be *willing to produce* the good.
  - This is the dollar value of gains from trade for the producer.

- Producer surplus is the area above the supply curve and below the market price up to the quantity actually demanded.

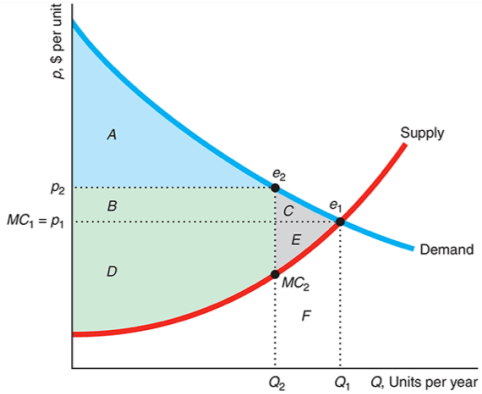
Producer Surplus



Total Surplus

- By definition, total surplus is the sum of consumer surplus and producer surplus.
- *Perfect competition maximizes total surplus. Producing less or more than the competitive level of output lowers total surplus.*

Equilibrium



	Competitive Output, Q_1 (1)	Smaller Output, Q_2 (2)	Change (2) – (1)
Consumer Surplus, *CS*	$A + B + C$	A	$-B - C = \Delta CS$
Producer Surplus, *PS*	$D + E$	$B + D$	$B - E = \Delta PS$
Total Surplus, $TS = CS + PS$	$A + B + C + D + E$	$A + B + D$	$-C - E = \Delta TS = DWL$

Deadweight Loss

Definition (Deadweight Loss)

The net reduction in total surplus from a loss in surplus by one group that is not offset by a gain in surplus by another group from an action that alters a market equilibrium.

Deadweight Loss

- Any government policy that limits trade in a competitive market reduces total surplus.
- The reduction in total surplus is the deadweight loss created by the policy.
- Example: The effects of a price ceiling.

Don't listen to David Suzuki!

- Important caveat: While government intervention reduces economic wellbeing when markets are perfectly competitive, **THIS IS NOT TRUE IN GENERAL!**

- *Government intervention may increase well-being in non-competitive markets, such as in a monopoly.*

Takeaways

1. Perfect competition is characterized by price taking.

2. With perfect competition:
   - Firms operate in the short run if price is above average variable cost, and the market equilibrium is determined by the intersection of demand and the short-run market supply curve.
   - Firms operate in the long run if price is above long-run average cost, and the market equilibrium is determined by the intersection of demand and the long-run market supply curve.

3. Perfect competition maximizes total surplus.