Competitive Markets: Characteristics, Long and Short Run equilibrium, and Some Implications

I. Where we are in the course?

To this point, we have shown that if people behave as "rational" net-benefit maximizers, then demand curves tend to slope downwards and supply curves tend to slope upwards.

- Market demand curves are a "horizontal sum" of individual demand curves.
- Since only downward sloping parts of individual MB curves carry over to individual demand curves, individual and market demand curves will be also be downward sloping (have negative slope) when consumers behave as net benefit maximizers.
- Because individual demand curves are constructed from consumer MB curves, market demand curves can be used to represent the marginal benefits of all consumers in the market of interest (MB_{con}).

- Market supply curves are a "horizontal sum" of individual firm supply curves.
- Since only upward sloping parts of individual firm MC curves carry over to their S curves, individual firm and market supply curves will be upward sloping (have positive slope) when firms in an industry behave as net benefit maximizers (profit maximizers).
- Because individual supply curves are constructed from individual firm MC curves, market supply curves can be used to represent the marginal costs of all firms in the market (industry) of interest (MC_{ind}).

When markets clear, the quantity of goods (or services) that consumers want to purchase exactly equals the quantity that firms produce for sale.

- When markets clear, the last unit sold has the property that $P^* = MR = MC = MB$

- This allows market prices to be used to approximate both the benefits consumers realize (at the margin) and the production cost of the last units of a good brought to market (at the margin).

A. Comparative Statics:

- Anything that systematically affects consumer MB curves will shift the market demand curve.
- Anything that systematically affects firm MC curves will shift the market supply curve.
- Every shift in a demand or supply curve changes both the equilibrium price and output of a market

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- (Nonetheless, the new equilibrium still tends to maximize social net benefits, given the new MB or MC curves and their associated SMB and SMC curves [again assuming no externalities].)

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- Note the logic of the "shocks" goes from individual firms or individual consumers to markets, since that is where market demand and supply curves come from.

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As we will see below, similar logic and effects also apply to **markets for inputs** such as labor

B. The theory of demand and supply are implications of the pure logic of choice in settings where both firms and consumers behave as "price takers."

Note that the properties of supply and demand were all **deduced** (derived) from the idea (assumption) that consumers and firm owners are rational--that is to say they have goals (net benefits, consumer surplus, profits, ..) and adopt means that are "cost effective" to advance those goals.

Microeconomic theory, in general, is a deductive exercise based on rational choice models.

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"Theory" is the "main dish" in this course--which is the most theoretical course that most undergraduate economics majors take. It is the most theoretical or the undergraduate microeconomic courses. (A close second would be mathematical economics.) Most of what we do in this course is to "deduce" the implications of rational choice for consumers, firms, and markets.

These theories can and have been tested using statistical methods and some laboratory experiments, where the models have been shown to work very well, although not perfectly.

Not much of what we are covering was or is "intuitively obvious," **except after the fact**, in the period before 1900. However, once the tools were understood, many of the conclusions seemed "natural" and economists began to better understand how prices help to coordinate a very broad range of decisions among a very large number of firms and consumers..

These models and conclusions took nearly a century to be worked out, and were not really worked out until after commerce became central to life in industrialized societies (around 1900).

So, don't be surprised if a good deal of what we cover in class is "hard" and seems "abstract," and is at least occasionally is counter intuitive. It was for those who invented he framework as well.

However, once you "have it," most of it will seem easy and "obvious," which of course it is not for folks that have not had this course.

You have to occasionally put your intuitions aside to understand the implications of the pure logic of choice. After you understand the models, your old intuitions tend to change and be more consistent with the logic of modern economics.

C. Markets and Efficiency revisited

When we first modeled market equilibrium, we found that markets that can be characterized with demand and supply curves tend to produce outputs that maximize social net benefits.

Market clearing prices--at both the level of single markets and an overall system of markets--also tend to achieve Pareto optimal outcomes (in the absence of externalities).

Both these results follow from our ability to use demand curve to represent consumer marginal benefits and to use supply curves as industry marginal costs.
In that case, the price at which demand equal supply produces the quantity where marginal social benefits equals marginal social costs.
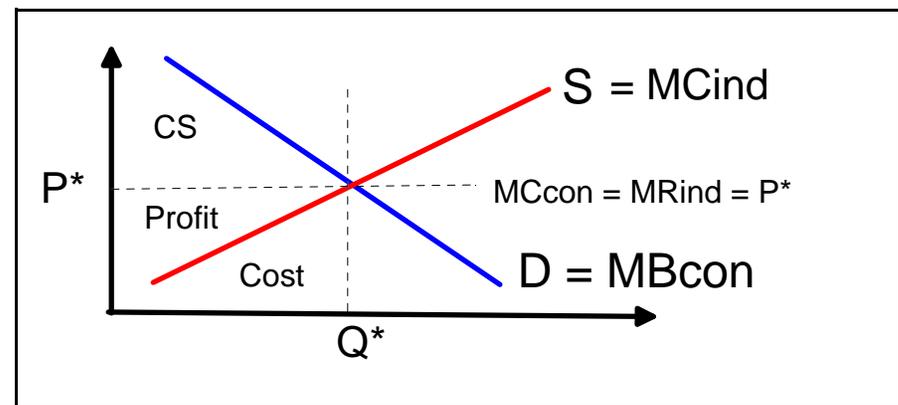
The gains from trade are divided between consumers and firms in most cases in the form of consumer surplus and profits.

The distribution of these net benefits varies with the particular slopes and shapes of the market demand and supply curves, but as long as demand is downward sloping and supply is upward sloping, the "social surplus" from producing and distributing goods and services is shared among buyers and sellers. (There are gains from trade.)

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As an exercise draw a series of demand and supply curves with different slopes to see how "price sensitivity" affects the distribution of social net benefits between consumers and firms.

D. Price-Taking Behavior

There are a variety of assumptions that we used to derive demand and supply curves, but the most important were the assumption on net benefit maximizing behavior, and that all firms and all consumers are "price takers."

Each side of the market is assumed to "rationally" adjust to the prevailing prices and maximizes their own net benefits (consumer surplus or profits).

It is this "price taking" behavior that we used to derive supply and demand. It is this "price taking" behavior that generates the particular supply and demand equilibrium that was efficient.

It is also this price taking behavior that helps to illustrate how **prices can coordinate** the decisions of firms and consumers so that markets clear.

Control over prices has been left out of the theory so far.

One possible explanation relies on **inventory adjustment** Market price falls toward P* when there are surpluses and rises toward P* when there are shortages. Prices and inventory adjustments thus tend to cause market clearing prices to emerge.

The next two blocks of material before the midterm further develop the logic of competitive models and use those models to analyze a few public policies.

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- What do we have to assume to make the "price taking" assumption of the above models reasonable?
- What happens if those characteristics are lacking?

- How do public policies affect consumer MB curves or firm MC curves and thereby market outcomes?

E. Market characteristics that are likely to produce "Perfectly Competitive Markets"

The market characteristics that produce "**price taking**" behavior are those that characterize what most economists refer to as the **assumptions of** "**perfectly competitive markets**." These include:

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- Large number of firms
- Large number of consumers
- Good price and quality information (perfect information)
- Complete ease of substituting across firms and across industries (freedom of exit and entry, [zero transactons costs])
- Inability to discriminate among customers
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- (In addition, it is assumed that there are no externality problems, although this is not discussed much in most intermediate micro textbook or courses.)
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(1) A large number of firms and consumers, means that no single consumer or firm is likely to affect the overall position of the market demand and supply curves. This will clearly be true if firms and consumers are all "small" relative to the overall market.

(2) Good price and quality information implies that consumers can shop across firms at very little cost (in the limit for free) and so will purchase goods and services from the least cost providers of the service--e.g. Those with the lowest prices.

(3) If firms cannot discriminate among customers, they have to charge a single price for their product(s).

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- The competition for consumers implied by (2) implies that firms are "forced" to match the prices of the low price firms or go out of business.

- This forces firms to sell at the same low price to all consumers.

(4) Properties 1-4 produce thus are sufficient to assure price taking behavior by firms and consumers, and if markets tend toward market clearing prices, our diagrams imply that.

  - Firms will sell their product at marginal cost.

  - Firms will produce outputs that set MC = MR = P at Q*, both at the firm level and at the market level.

  - Consumers will purchase products out to the point where their marginal benefits equals their marginal cost which is equal to the prevaling market rice.

  - So MB=MC=P* for consumers at Q* at both the individual and market level.
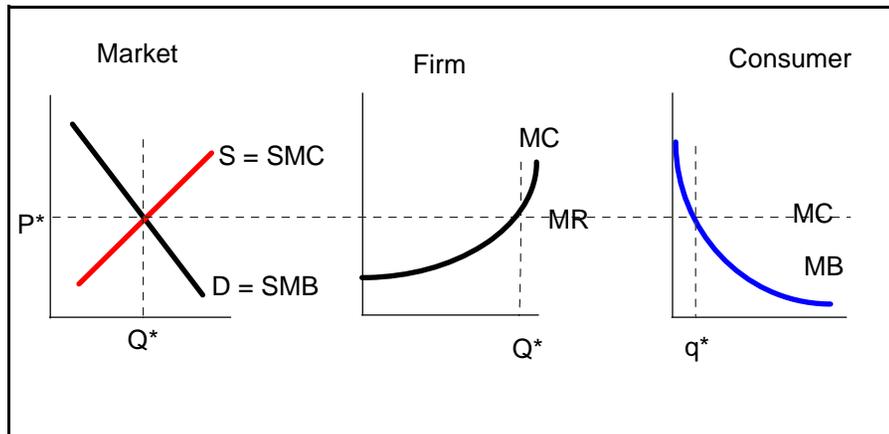
Again, this all follows from the pure logic of choice--given market characteristics that define a perfectly competitive market and a tendency of market prices to clear markets.

- The Logic of One Price: suppose two firms sell identical products and firm A sets a price that is 10% higher than firm B. What happens?

- Answer, all the customers go to firm B, and none go to firm A.

- Firm A either lower's its price of goes out of business.

- Competitive markets are sometimes said to be an "iideal type" rather than a realistic model of real markets. What is the value of such "ideal" models? To what extent does simplicity help us to understand how markets operate?

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[As an exercise, shade in the areas in the three diagrams above that correspond to social surplus, consumer surplus, and profits. Label all details.]

F. Prices as a Coordination Device

Note that the effect of market clearing prices is to coordinate the decisions of consumers and firms both within a single market and across markets.

For example, if an input becomes more scarce because of bad weather, the price of that input tends to rise, which increases the marginal cost of firms that produce products that use that input. This causes supply curves to shift to the left (Supply to "fall") which in turn produces a new higher market clearing price for the outputs of interest. This, in turn, induces consumers to cut back on their use of those outputs after markets have cleared.

All this "rationing behavior" happens without and centralized "control" method, simply because of market forces. This coordinating effect of prices is sometimes referred to as the "invisible hand."

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The same three diagrams can be used to characterize the effects of a systematic change in either firm marginal costs or consumer marginal benefits.
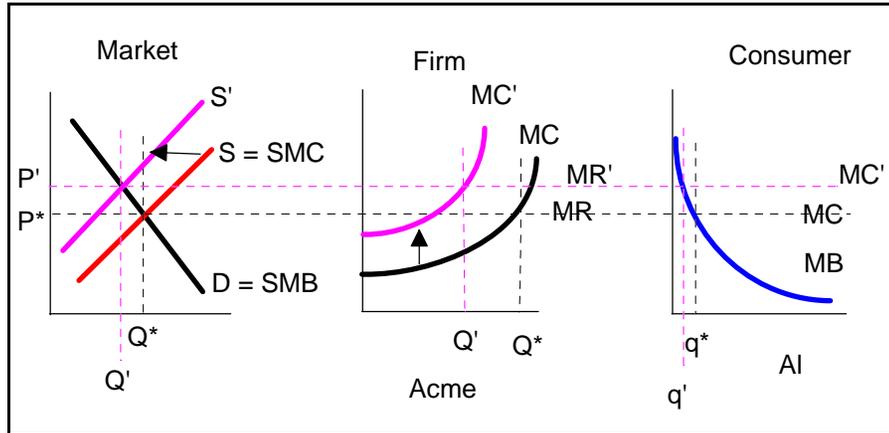
For example, suppose that the cost of some input increases. How does this affect firm, market, and consumer choices?

The higher marginal costs of firms, implies that firms will sell less at the original price, shifting market supply back to the left (at the old price the sum of firm outputs is smaller than before). This causes prices to rise to P', which causes the typical firm to adjust their output (to Q') and consumers to adjust their consumption (to q').

Note that it is market price that coordinates the behavior of firms and consumers so that supply once again equals demand.
- Adam Smith (1776) referred to this adjustment process as the invisible hand.
- Fredrich Hayek emphasized this role of prices in a famous paper (1945) that helped him to win a Nobel prize in economics (1974).
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Recall that market demand curves are based on individual demand curves which are based on individual MB curves. So **anything that systematically affects marginal benefits** (the highest price that a person is willing to pay for successive units of a good), **will shift the market demand curve.**

Recall that market supply curves are based on individual firm supply curves which are based on individual firm MC curves. So, **anything that systematically affects a firm's MC curve will shift the market supply curve.**

- Economic shocks go from individual consumers and firms to markets, because markets are composed of individual consumers and firms.
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G. More on the Difference between Ricardian and Marshallian Long Run Supply

Economists usually distinguish between short and long run market equilibria.
- In the short run, some factors of production cannot be varied. (A firm may have particular machines, buildings, and production method, that are "fixed" in the short run.)
- In the long run, firms can vary all factors of production and may exit or enter industries. The ability to adjust all factors implies that marginal cost (of output expansions) tends to be lower in the long run than in the short run.

Economists use at least two different models of long run equilibrium in competitive markets: the **Ricardian Model** (used mostly in this class) and the **Marshallian model** (used in most other intermediate micro classes).

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In a **Ricardian long run equilibrium**, firms in an industry differ: they may have different marginal cost curves because they have better management, use different production methods (perhaps because of trade secrets) or better and worse locations.

In a **Ricardian long run equilibrium**, low and high cost producers may co-exist and prices will be determined by the marginal cost of the last unit of the product sold. All but the marginal firm(s) (the highest cost or least efficient viable firms) will earn positive profits, with the most efficient firms earning the highest profits.

In the Ricardian model, gains to trade are shared between firms and consumers at long run equilibrium, just as they are at short run equilibrium.

The long run supply curve in a Ricardian market slopes upward and can be used to approximate the long run marginal cost curve for the industry. All of our usual geometric tools and reasoning apply in such markets. Long run supply adjustments occur because of supply adjustments (including purchases of capital goods) to higher or lower prices.

In a **Marshallian long run equilibrium**, only the lowest cost (efficient) firms survive, so all firms have the same MC curves. In addition, they are all efficiently sized (produce at minimum average total cost). Adjustments in the LR take place through the entry and exit of firms. If profits exist, entry will occur. If losses exist, exit will occur. Entry or exit stop only when all firms in the industry earn zero profits. In LR Marshallian equilibrium, all firms earn zero profits (that is, their opportunity cost rate of return).

The long run supply curve in a Marshallian model is a consequence of exit and entry of identical firms, rather than firm level adjustments. So the long run supply tends to be a horizontal line rather than an upward sloping line.

As a consequence, in the long run, the Marshallian model predicts that all gains to trade go to consumers and profits of firms are zero.

Although there are important differences, there are also several common predictions:
- In either case, there must be diminishing marginal product (and so increasing marginal cost) at the outputs chosen by all firms.
- If this were not the case, the firms would not be maximizing their profits at their chosen output level, but would be better off increasing their production.
- In long run equilibrium $MC(Q^*) = MR(Q^*) = MB(Q^*) = P^*$
- In both cases, competitive markets tend to produce the output that maximizes social net benefits.
- However, in the Marshallian case all the social net benefits go to consumers, rather than being shared between firms and consumers.
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For the most part in this course, we'll use the Ricardian long run model, rather than the Marshallian one, because it is a natural extension of our tools and because more contemporary markets appear to be Ricardian than Marshallian

The short run models of the Ricardian and Marshallian perspective are essentially the same. Market supply is Industry short run marginal cost in both cases, but the firms are all the same in the Marshallian model.

Marshallian LR Equilibrium
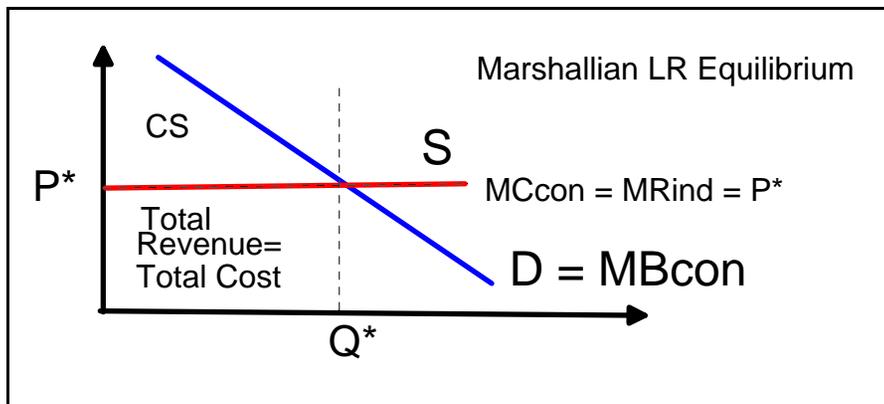
II. Imperfect Competition: the Absence of Some "Competitive Characteristics"

Not all real world markets have all of the above characteristics.

- Some markets have only a handful of firms or consumers. Transactions and search costs are often non trivial.

- Entry and Exit barriers of various kinds (natural and regulatory) often exist.

- All of these "violations of competitive assumptions" will affect market outcomes and may affect the efficiency of markets.

We will take up other market structures after the exam, but before doing so we will examine some applications of competitive market analysis.

The next hand out and its associated lectures will analyze (i) input markets and (ii) how public policies tend to affect competitive markets, which may (iii) undermine the efficiency of competitive markets.