

Consumers, Producers and Efficiency of Markets

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Surplus, welfare, and welfare effects

- This is a rather abstract lecture, but with strong implications
 - but first one must go through a number of definitions...
- What is consumer surplus?
- What is producer surplus?
- What is the efficiency, how is it related to markets
- What is a welfare analysis?

Markets

- The study of economics examines how individuals, firms and governments make decisions to allocate limited resources.
- Typically they make decisions on the markets
- A market is a place where goods or services are being bought and sold,
 - Free market is based on voluntary decisions of the market participants
- What if a government wants to do something?
- What if there are multiple options to do something (e.g. levying a tax vs. quotas)?
- What if the market outcome is not deemed as desirable?

Price

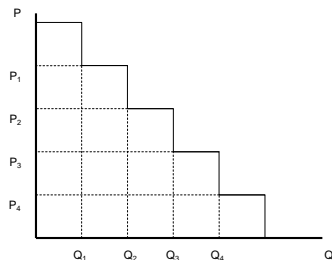
- In order to exchange the goods and services, the market participants use the price
 - price in general will carry as a tool to automatically exchange information between market participants
 - price is a result of demand and supply interaction
 - but both demand and supply are functions of prices
- The determination of price is not depending on the existence of money, you can exchange one apple for two tomatoes
- If you wish to enter multiple markets, it is inconvenient to follow that one apple = two tomatoes, one tomato = 3 pears, 1 pear = 0.3 liter of milk etc.
- If you choose e.g. an apple as the measure of value, you are using this apple as the so-called "numéraire"
- *Numéraire* is a basic standard by which value is computed.

Consumers

- Individuals: people entering the markets to satisfy their needs and desires
 - by consumption of goods and services
- The behavior of the consumers is governed by their effort to maximize their utility
 - by consumption of goods and services
 - but bear in mind the resources of the consumers are limited!
- The consumer has to make decisions, regarding his or her consumption, in order to gain maximum utility, using his limited resources as best as he or she can.

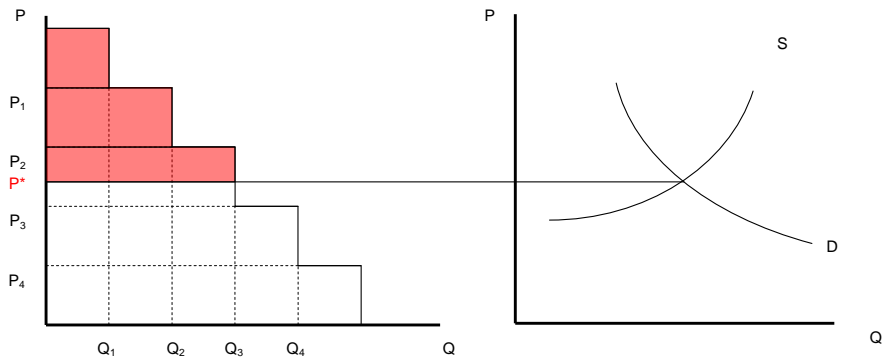
Willingness to pay

- The consumer is willing to pay certain *maximum* amount for a unit of goods
- If the price is lower or equal, he (or she) will decide to buy the given unit of goods - as this decision will bring him (or her) higher level of utility than alternate choices
- Consumer is a price taker, which means he (or she) will respond to the market price in his (or her) decision to buy certain amount of goods



The consumer surplus

- If the price actually paid for the unit of goods is lower than the maximum price the consumer would be willing to pay, the consumer gains the so-called *consumer surplus*



Law of demand

- *Ceteris paribus*, as the price of a product increases, quantity demanded falls (or as the price of a product decreases, quantity demanded increases).
- It illustrates the diminishing marginal utility of a given good or service for the individual consumers.
 - Market demand is constructed as a horizontal sum of *individual* demands

Producers

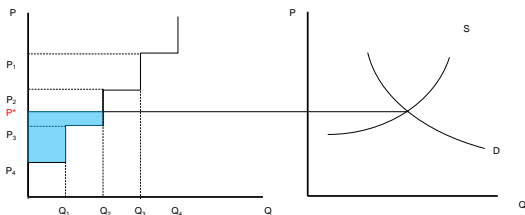
- The effort of the producers (firms) is to maximize profits.
 - The owners of the production factors and the owners of the firm are eventually people, that want to maximize their utility
 - Maximizing firm's profits will lead to higher income
 - Higher income will increase the maximum attainable utility of the owners (they are also consumers)

Producer surplus

- In a similar fashion to consumer surplus: a firm sells all its units of production for the given market price (e.g. 50 CZK)
 - however, the firm might be willing to sell various units of the production for various prices (this is called the willingness to sell)
 - e.g. the first unit of production for 10 CZK, second unit for 15 CZK, third for 25 CZK etc.
- By selling for a market price, the price for each unit is higher than what the firm would be willing to accept at the bare minimum, the firm gains a surplus - this is called the producer surplus

Producer surplus

- The firm can be price taker (in a perfectly competitive case), or it can influence the price to a certain extent, BUT:
 - firm will make the decision on the quantity produced based on the marginal revenue (and therefore based on the market demand!)



Law of supply

- Ceteris paribus, an increase in a price results in an increase in the quantity supplied (or a decrease in a price results in a decrease in the quantity supplied)
 - It illustrates the diminishing marginal returns in production
 - if one wants to produce a higher quantity of output, it means the cost of production increases - then a higher supply price is needed to produce more

Total surplus

- Both the producers (sellers) and consumers (buyers) gain surplus by participating in the market
- $TS = CS + PS = (\text{value to consumers} - \text{amount paid}) + (\text{amount paid} - \text{cost to producers}) \rightarrow TS = \text{value to consumers} - \text{cost to producers}$
- The total surplus is typically maximized under the free market's allocation
 - under perfectly free market conditions, no government action would be rational from the economic viewpoint

Total surplus and the policy action

- A public policy is typically advocated as a policy that might increase the total surplus (above that of the market's allocation)
 - This might hold true, if there are special circumstances, such as the monopoly or negative externalities
 - Some schools of thought consider the special circumstances as inherently temporary on the truly free market
- The typical case of welfare analysis is not increasing the total surplus above the free market's allocation (but it might increase above the market's allocation)
 - it might assist in the decision process of the selection between various scenarios (typical case: competition policy)

Efficiency

- The measure of the total surplus can be used to evaluate the efficiency of the "baseline scenario" (in essence, the market outcome without intervention) compared to the efficiency of the outcome of selected action (in essence, after the government intervention)
 - for practical reasons, the consumer surplus is often used as a measure of government intervention (e.g. in competition policy)
- Highest efficiency means that:
 - the optimal quantity of goods is being produced (lower amount would leave someone willing to pay more than what it costs to produce; the higher amount would mean the resources are being wasted)
 - the resources are *used in the most efficient way* (i.e. by the most efficient firms (the firms compete with each other, only those who do best "survive"))
 - the resources are allocated to *fulfill the most needed desires* (the goods are consumed by those who value them most highly)

Pareto efficiency

- Such allocation of resources when it is *impossible* to make any single individual better off without making at least one individual worse off
 - Pareto improving action: a change in resource allocation that makes at least one individual better off *without making any other individual worse off*
- The so-called First Welfare Theorem: a system of free markets will lead to a Pareto efficient outcome

The Invisible Hand

- On the unhampered free market with well defined property right, the choices of the individuals lead to optimal situation (Pareto efficiency).
 - the market allocation of resources is decentralized (the result of interactions of large numbers of self-interested buyers and sellers)
 - there is no need for any central organization or person to "organize" the allocation of resources or expression of the needs of the buyers
 - there is no need for government interventions: the so-called "Laissez faire" (~"let them do as they will")
- This efficiency of the market processes was described by Adam Smith as "the invisible hand" of the free market
 - By following purely *individual* interests, the market participants contribute to the highest possible efficiency of the allocation of the limited resources, and thus to the well-being of all others
- In "special circumstances" the Invisible hand might not be sufficient

Welfare analysis

- Branch of economics devoted to the estimation and evaluation of the welfare effects
- Given the First Welfare Theorem might not hold under special circumstances, government might want to intervene, to improve the outcome
 - Democracy and the political principle of majority might set a different "socially desirable" goals for the government
- Two major goals of any welfare analysis:
 - Is a given resource allocation efficient (compared to the "baseline result" of the market outcome)?
 - Who and how much gains and who and how much loses under various allocations?

Welfare economics

- Policy analysis regarding
 - Regulation of market structure (e.g. monopoly, monopsony, oligopoly, oligopsony, or conditions of monopolistic competition)
 - Market failures and externalities
 - Price discrimination and price skimming
 - Imperfect information (asymmetric information, transaction costs, principal–agent problems)
 - Taxes and tariffs
- But also (arguably much more subjective) questions regarding "social welfare":
 - one of the most typical topics: measurements of inequality and poverty
 - "social justice", equality or equity (egality), "the needs of the many outweigh the needs of the few" (see Star Trek: The Wrath of Khan for reference :))

"Special circumstances"

- "Laissez faire" might not be the best course of action at all times
 - the free market conditions might not be met (e.g. monopoly)
- There is no market
 - without property rights, no one can buy and sell
 - without buying and selling, there is no price
 - without a price, the market allocation does not work!
- The transaction costs prohibit the establishment of a market
- The laws prohibit the establishment of a market
- The government decided for a certain type of action
 - e.g. political promises in elections
 - concurrent policy intervention in a different area

The trouble of welfare economics

- The Invisible Hand uses *objective* information, carried by price signals
- No one can gather and assess all the information in the market
 - government intervention needs to rely on the *estimates* of the *purely subjective* values
 - there is no way to compare the utility across individuals (utility is strictly *subjective*)
- Social sciences do not allow for the methods of the natural sciences (the experiment requires controlled environment and replicability!)