Microeconomics

Perfect competition

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Structure

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- Household theory
- Theory of the firm
- Perfect competition and welfare theory
  - **Perfect competition**
  - The first welfare theorem
  - Monetary assessment of environmental impacts
- Types of markets
- External effects and public goods

Pareto-optimal review

Overview

- Basic assumptions of the perfect-competition model
- Market equilibrium
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Basic assumptions of the perfect-competition model

- Individual consumers and firms are price takers
  = quantity choice
- Firms and consumers are perfectly informed.
- Firms can enter and leave the market at no cost.
- No transaction cost
- Many market participants with small quantities

Problem

Please, complete: Firms that are price takers face a ... demand curve for goods. The elasticity in this case equals ... and the marginal revenue equals ... . Similarly factor-supply curves fulfill: ...

Market equilibrium

- Equilibrium: Economic subjects have no incentive to change their behavior.
- Equilibrium on markets with price takers:
  - Households are in a household optimum with respect to goods demanded and factors supplied.
  - Firms demand factors and supply goods such that their profit is maximized at the given prices.
  - There is neither excess demand nor excess supply.

Chinese demand of American pecan nuts

The Wall Street Journal Europe (19.04.2011):
China goes nuts over pecan crop

- Five years ago, China bought hardly any pecans.
- Liu Wei, a 61-year-old retired chemistry teacher:

  We used to eat only walnuts, and then we saw on TV that pecans are more nutritious than walnuts.

- In 2009, China bought one-quarter of the U.S. crop, and there's no sign demand is abating.
- Eventually, more trees will be planted, but a pecan takes eight to 10 years to bear fruit.

Characterization of the long-run market equilibrium

- Profit function of the firm:

$$\Pi(y) = py - C(y)$$

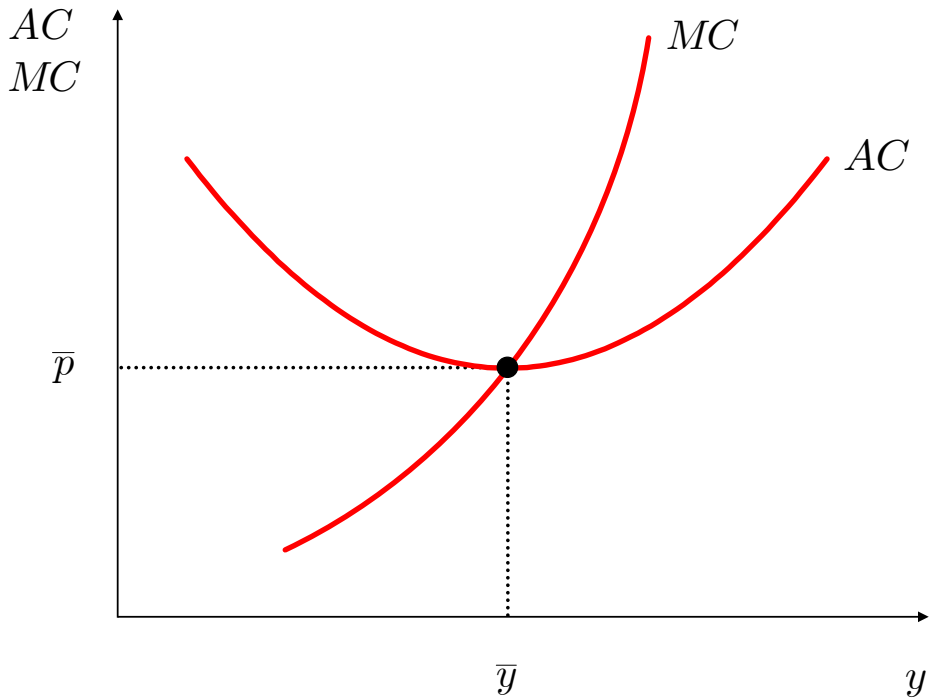
- Optimality condition:

$$p \stackrel{!}{=} MC$$

- Free market entry and exit
  $\Rightarrow$ neither profits nor losses

$$p \stackrel{!}{=} AC$$

Characterization of the long-run market equilibrium



$$MC \overset{!}{=} \bar{p} \overset{!}{=} AC.$$

Characterization of the long-run market equilibrium

Problem

100 000 firms, not all active in the market

Cost function $C(y) = \begin{cases} 100 + y^2, & y > 0 \\ 0, & y = 0 \end{cases}$

Poll tax for every firm €300, to be paid if $y > 0$

$D(p) = 1.000(120 - p)$.

- Long-run prices with and without poll tax?
- How many firms are active with and without poll tax?

Short-run and long-run effects of a rent ceiling

Problem

Should a rent ceiling lie above or below the long-run equilibrium rent?

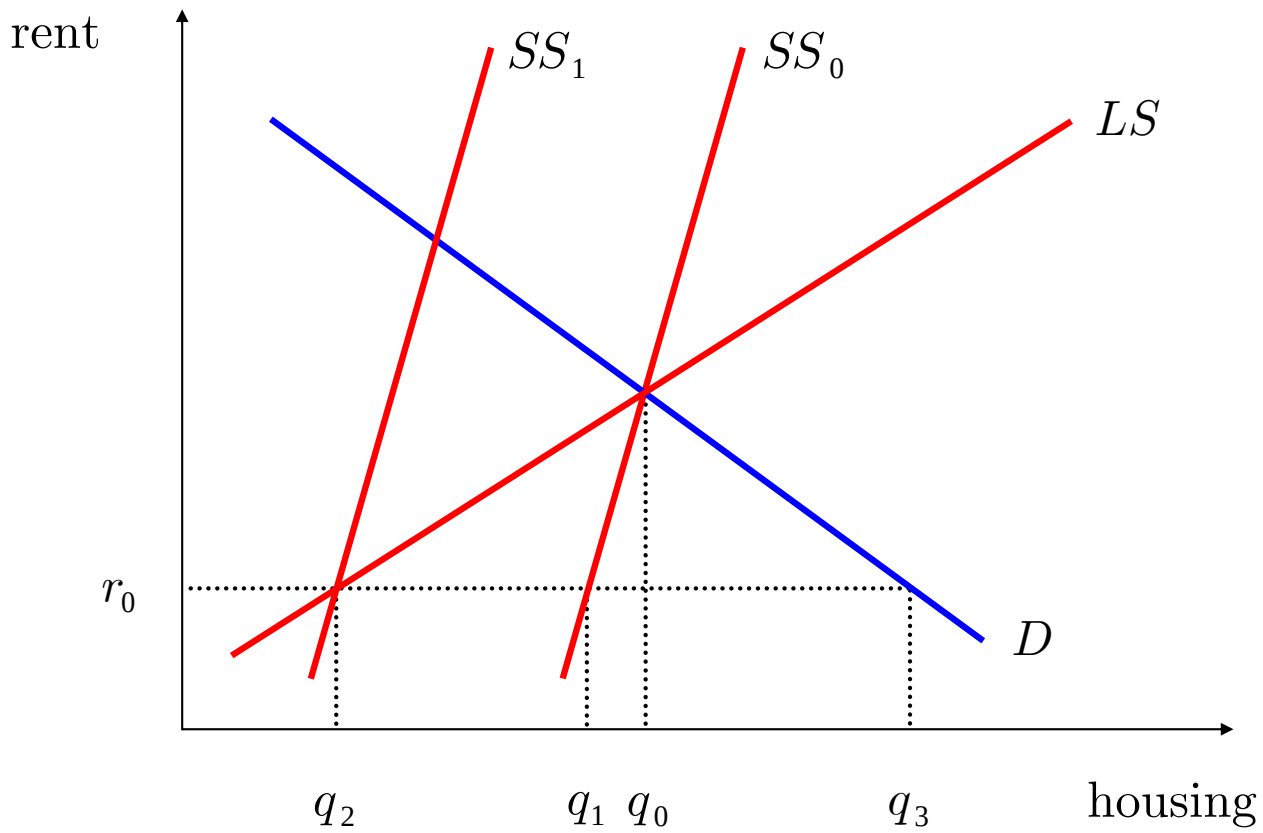
Assumption:

Expansion of housing construction

- increases input prices (e.g., for land) and
- thereby leads to an increase in cost

$\Rightarrow$ Long-run supply curve is positively sloped

Short-run and long-run effects of a rent ceiling



Short-run and long-run effects of a rent ceiling

functions of prices	**explanation**
rationing and discrimination (Sh 36) of demand	Only those potential buyers whose willingness to pay is as large as the price will buy the product.
information on shortages and signal to act	High prices inform buyers and sellers that there is a shortage. Consumers decrease consumption and firms extend production.
responsibility for cost of production	In equilibrium it holds that $p = MC$ and $p \leq MZB$. Individuals want to buy if and only if their willingness to pay is at least as large as production cost.

Application of the perfect-competition model

The economic theory of socialism

- Some economists have used the perfect-competition model to establish the concept of a socialist economy. The Polish economist Oskar Lange (1904-1965) has been a leading representative of this school of thought.
- Lange's socialist economy consists of state-owned firms directed by state officials.
- These officials have to base their decision on the prices announced by a central planning board. They are asked to react to these prices as price takers, minimizing costs and maximizing profits just as firms do in microeconomic textbooks.
- According to Lange's theory the central planning board has the same function as the Walras' auctioneer. By a process of trial and error, the central planning board tries to get as close as possible to the equilibrium price vector.

Application of the perfect-competition model

The economic theory of socialism

Lange (1936, p. 66) claims:

..the accounting prices in a social economy can be determined by the same process of trial and error by which prices on a competitive market are determined. .. The only "equations" which would have to be "solved" would be those of the consumers and the managers of production plants. These are exactly the same "equations" which are solved by the present economy system and the persons who do the "solving" are the same also.

Application of the perfect-competition model

The economic theory of socialism

- Of course, Oskar Lange's work precedes the introduction of the problems of asymmetric information and the present literature on incentives.
- But even in Lange's time, Friedrich August von Hayek (1937, 1945) and others pointed out that there is no conceivable way that a central planning board could obtain the information (partly contradictory), held by millions of consumers and producers.
- Many people will feel thankful that the General Equilibrium Theory could not be put into practice as proposed by Oskar Lange.

Application of the perfect-competition model

The regime of competition of the Freiburg School of "Ordoliberalism"

- Walter Eucken (1891– 1950) is a leading proponent of the Freiburg School of *Ordoliberalism*. Eucken's (1990) regime of competition (*Wettbewerbsordnung*) is based on perfect competition: "die Herstellung eines funktionsfähigen Preissystems vollständiger Konkurrenz [wird] zum wesentlichen Kriterium jeder wirtschaftspolitischen Maßnahme gemacht". This is the basic principle (*Grundprinzip*), the first of a set of principles called *"konstituierende Prinzipien"* (pp. 254 – 291).
- Other principles belonging to this set are
  - monetary stability (Primat der Währungspolitik),
  - open markets (Offene Märkte),
  - private property (Privateigentum),
  - freedom of contract (Vertragsfreiheit),
  - accountability (Haftung),and
  - economic policy consistency (*Konstanz der Wirtschaftspolitik*).

Application of the perfect-competition model

The regime of competition of the Freiburg School of "Ordoliberalism"

- Apart from the "konstituierende Prinzipien" Eucken's regime of competition is build on the so-called regulating principles (*regulierende Prinzipien*). The author suggests that an anti-monopoly bureaucracy (*Monopolamt*) should deal with monopoly problems:
  - Monopolies have to be dissolved or, should dissolution be impossible, to be regulated (see Eucken 1990, p. 297).
  - The institutions (firms, unions) that wield power should be forced to act as if perfect competition held. For example, in order to emulate the law of one price, price discrimination is to be outlawed (Eucken 1990, p. 294). Also, regulation should aim for marginal-cost pricing (see Eucken 1990, p. 297). However, since marginal costs are difficult to ascertain, Eucken (1990, p. 297) suggests that the intersection of average cost and demand be used instead. This is Ramsey pricing.
  - The prices fixed by the Monopolamt are meant to incite firms to reduce costs whenever possible. Eucken (1990, p. 297) observes that a monopoly's production capacities are often outdated and advises the Monopolamt to revise prices from time to time.

Application of the perfect-competition model

Computable general equilibrium theory

- Computable GET sets out to build a dynamic multi-market model where the specific functions and values derive from real-world data.
- For any given set of parameters (taxes set by government, environmental regulation, climate change), a path of equilibrium prices and quantities is found by empirical analyses and simulations.
- The prices and quantities are given in numerical form (concrete numbers).
- Therefore, it is not always easy to tell why a specific policy change had the observed consequences.

The Austrian perspective

- The Austrian School of Economics criticizes the way competition is presented in the models of perfect competition (and industrial organization). We will focus on some contributions to competition theory by Friedrich August von Hayek.
- In particular, he discusses
  - equilibrium analysis (he concentrates on the equilibrating forces rather than on the equilibrium itself),
  - knowledge assumptions (he stresses the importance of dispersed knowledge, imagination and surprise), and
  - the role of the entrepreneur in market processes (the Austrian entrepreneurs do not "mechanically" maximize profits but discover profit opportunities and act as arbitrageurs).

The Austrian perspective

Friedrich August von Hayek: the price system as a machinery for registering change

Friedrich August von Hayek is concerned with the question of who knows what and how people obtain information in order to make good decisions. Since society needs to adapt to constant changes, von Hayek (1945, pp. 524) insists on decentral decisions

> *"because only thus can we ensure that the knowledge of the particular circumstances of time and place will be promptly used. But the "man on the spot" cannot decide solely on the basis of his limited but intimate knowledge of the facts of his immediate surroundings. There still remains the problem of communicating to him such further information as he needs to fit his decisions into the whole pattern of changes of the larger economic system."*

The Austrian perspective

Friedrich August von Hayek: the price system as a machinery for registering change

According to von Hayek (1945, pp. 526), in such circumstances, it is the prices that

> *"can act to coordinate the separate actions of different people ... Assume that somewhere in the world a new opportunity for the use of some raw material, say tin, has arisen, or that one of the sources of supply of tin has been eliminated. It does not matter for our purpose – and it is very significant that it does not matter – which of these two causes has made tin more scare. All that the users of tin need to know is that some of the tin they used to consume is now more profitably employed elsewhere, and that in consequence they must economize tin."*

The Austrian perspective

Friedrich August von Hayek: the price system as a machinery for registering change

- For von Hayek (1945, pp. 527), the price system is "a kind of machinery for registering change". He goes on to say:

> *"The marvel is that in a case like that of a scarcity of one raw material, without an order being issued, without more than perhaps a handful of people knowing the cause, tens of thousands of people whose identity could not be ascertained by months of investigation, are made to use the material or its products more sparingly, i.e., they move in the right direction."*

- Summarizing the important 1945 paper, Hayek emphasizes the price system as a machinery for registering change in a world of dispersed knowledge of particular circumstances.

The Austrian perspective

Friedrich August von Hayek: competition as discovery procedure

Friedrich August von Hayek is also famous for his 1968 lecture "Der Wettbewerb als Entdeckungsverfahren" at the "Institute for the World Economy" in Kiel. von Hayek writes:

> *"... wherever we make use of competition, this can only be justified by our not knowing the essential circumstances that determine the behavior of the competitors. In sporting events, examinations, the awarding of government contracts, or the bestowal of prizes for poems, not to mention science, it would be patently absurd to sponsor a contest if we knew in advance who the winner would be."*

The Austrian school

Friedrich August von Hayek: competition as a discovery process

von Hayek then goes on to observe:

> *"... market theory often prevents access to a true understanding of competition by proceeding from the assumption of a "given" quantity of scarce goods. Which goods are scarce, however, or which things are goods, or how scarce or valuable they are, is precisely one of the conditions that competition should discover: in each case it is the preliminary outcomes of the market process that inform individuals where it is worthwhile to search. Utilizing the widely diffused knowledge in a society with an advanced division of labor cannot be based on the condition that individuals know all the concrete uses that can be made of the objects in their environment. Their attention will be directed by the prices the market offers for various goods and services."*

Joseph Schumpeter: Creative destruction

In 1942, Joseph A. Schumpeter published a book with the title "Capitalism, Socialism and Democracy". Schumpeter argues that socialism rather than capitalism will survive in the long run. The second part of this book (Can Capitalism Survive) contains a chapter on "The Process of Creative Destruction". Schumpeter writes:

> *"Capitalism ... is by nature a form or method of economic change and not only never is but never can be stationary. [...] The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates. [...]*

Joseph Schumpeter: Creative destruction

But in capitalist reality as distinguished from its textbook picture, it is not that kind of competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization ... competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives. This kind of competition is as much more effective than the other as a bombardement is in comparision with forcing a door, and so much more important that it becomes a matter of comparative indifference whether competition in the ordinary sense functions more or less promptly: the powerful lever that in the long run expands output and brings down prices is in any case made of other stuff."

Central tutorial I

Problem L.9.1.

Perfect competition. Long-run cost function:

$$C(y) = \begin{cases} 100 + y^2, & y > 0 \\ 0, & y = 0, \end{cases}$$

Market demand $Y(p) = 10(120 - p)$

a) Average and marginal cost?

b) Number of firms in equilibrium?

Problem L.9.2.

Inverse demand function for apples $p(q) = 100 - 2q$

Inverse supply function for apples $p(q) = 1 + q$.

Equilibrium price and quantity?

a) without taxes

b) with a quantity tax of 9 on apples (consumers pay)

c) with a quantity tax of 9 on apples (firms pay)

Central tutorial II

Problem L.9.3.
Supply function $S(p) = 10 + 2p$
Demand function $D(p) = 30 - 2p$

a) Equilibrium price?

b) Quantity for the price cap $p = 4$?

c) Quantity for the price cap $p = 6$?

Problem L.9.4.
Weekly market
Supply of 100 eggs; no additional production, no storage
Demand function $D(p) = 101 - p$

a) Equilibrium market price?

b) Induced by a clever advertisement, demand doubles. Market price?