Advanced Microeconomics

General equilibrium theory II: criticism and applications

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General equilibrium theory II: criticism and applications

Nobel price for Friedrich August von Hayek

In 1974

'for their pioneering work in the theory of money and economic fluctuations and for their penetrating analysis of the interdependence of economic, social and institutional phenomena'

1/2 Gunnar Myrdal from Sweden, and

1/2 Friedrich August von Hayek.

The jungle economy

Definition

A jungle economy is a tuple

$$\mathcal{J} = \left(N, S, G, \omega, \left(\precsim^i \right)_{i \in N} \right), \text{ consisting of}$$

- the set of agents $N = \{1, 2, ..., .n\}$,
- a power relation S on N,
- the finite set of goods $G = \{1, ..., \ell\}$
- a total endowment $\omega \in \mathbb{R}^{\ell}_+$,

and for every agent $i \in N$

- a preference relation $\precsim^i$.

The jungle economy

- In a jungle economy, the n agents from N consume bundles consisting of ℓ goods from G.
- iSj means that i is stronger than j – S is a transitive relation.

The jungle economy

Definition
Let $\mathcal{J} = \left(N, S, G, \omega, \left(\precsim^i \right)_{i \in N} \right)$ be a jungle economy. An allocation $\left(x^i \right)_{i \in N}$ in $\mathcal{J}$ is called feasible if $\sum_{i=1}^n x^i \leq \omega$ holds.

Definition
A feasible allocation $\left(\widehat{x}^i \right)_{i \in N}$ is called a jungle equilibrium if there is no agent $i \in N$ and no bundle y^i such that $y^i \succ \widehat{x}^i$ and $y^i \leq \widehat{x}^i + \widehat{x}^0 + \sum_{\substack{j \in N, \\ iSj}} \widehat{x}^j$, where $\widehat{x}^0 := \omega - \sum_{j \in N} \widehat{x}^j$ is the leftover.

Theorem (Existence and uniqueness of jungle equilibria)

Let $\mathcal{J} = \left(N, S, G, \ \omega, \left(\precsim^i\right)_{i \in N}\right)$ be a jungle economy. Under some mild assumptions, a unique equilibrium exists where the strongest agent grabs what he wants, the second strongest agent takes from the rest etc.

Theorem (Pareto efficiency of the jungle equilibrium)

The unique equilibrium is Pareto-efficient.

Applications

Under the heading of applications, we report

- how socialist planning was thought to benefit from GET (the economic theory of socialism),
- in which way the ordoliberal school (and some of nowaday's competition theory and policy) proposes to apply GET to regulation and competition policy,
- how empirical analyses and simulation build on GET models to see the complex consequences of policy changes.

Applications
The economic theory of socialism

- ▶ Some economists have used the General Equilibrium Theory 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.

Applications

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.

Applications

- ▶ 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.

Applications

- ▶ 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*).

Applications

- ▶ 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

Applications

- ▶ 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 and Israel Kirzner.

- In particular, these economists discuss
  - equilibrium analysis (they concentrate on the equilibrating forces rather than on the equilibrium itself),
  - knowledge assumptions (they stress 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

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

▶ 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 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 perspective
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."

The Austrian perspective
Israel Kirzner

Building on von Hayek's and von Mises' ideas, Israel Kirzner's entrepreneurial-discovery theory deals with three interrelated concepts,

- ▶ the entrepreneur,
- ▶ discovery, and
- ▶ rivalrous competition.

The Austrian perspective
Israel Kirzner

The daring, alert entrepreneur [...] buys where prices are "too low" and sells where prices are "too high". In this way low prices are nudged higher, high prices are nudged lower; price discrepancies are narrowed in the equilibrative direction.

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.

A critical review of GET
General equilibrium theory

- ▶ Using GET we can analyze any number of markets simultaneously and can also deal with risk (given probabilies).
- ▶ Utopian capitalism:
  - ▶ impersonal nature of economic transactions.
    Agents just have to observe the price vector and do not need to do complicated deals with other (possibly several) agents.
  - ▶ no theft,
  - ▶ no quality problems,
  - ▶ no market concentration.

A critical review of GET

General equilibrium theory

- ▶ GET deals with many markets (specified by attributes, place, time, contingencies) all of which are assumed to have many sellers and buyers. However, in the real world, there are not many buyers or sellers of white pianos to be delivered in Leipzig in September 2012 should it rain the day before.

- ▶ Increasing returns to scale are commonplace but contradict convex production sets. Therefore, it is unlikely that many small producers will enter the market. Therefore, price-taking behavior is a strong assumption.

- ▶ Even in theory, it is an open question how the auctioneer suggests price vectors, based on the information of excess demands. Plausible tâtonnement processes will not guarantee stability of the Walras equilibria.

- ▶ GET does not address the question of how prices are formed —> Austrian critique of perfect competition.

A critical review of GET

General equilibrium theory

- ▶ Contracts in GET are complete and simple: Goods are exchanged for other goods or against money. But
  - ▶ Contracting in everyday life is seldom done on the basis of complete contracts.
  - ▶ Bowles (2004, p. 10) claims that norms and power replace contracts. "An employment contract does not specify any particular level of effort, but the employee's work ethic or fear of job termination or peer pressure from workmates may accomplish what contractual enforcement cannot."
- ▶ Walrasian exchange is but a very small part of social exchange. Social exchange often takes place in long time intervals and it is not always clear to the participants who owes what to whom. Social exchange relations exist in markets, between neighbors, colleagues or politicians.
- ▶ GET is based on utility maximization and is hence susceptible to criticism levied against "rationality" (intransitivity, loss aversion, inconsistency in temporal discounting, ...).

A critical review of GET

- ▶ Pareto optimality and extreme inequality of consumption or income can go hand in hand.

- ▶ Free markets are wonderful because they are Pareto efficient. But how about the Pareto-efficient jungle?

- ▶ Maybe, free markets are wonderful for reasons not directly connected to the welfare theorems.
  Hayek (1945, p. 527) —> the price system is "a kind of machinery for registering chance" and makes people move in the right direction (In GET, people do not "move in the right direction", but jump to the new equilibrium bundle if parameter changes occur.)