Module 3

Lecture 23

Topics

3.8 Walras and General Equilibrium

3.8.1 Decentralized allocation and fundamental theorem

3.8.2 Limitations of FFT and SFT

3.8 Walras and General Equilibrium

- Leon Walras (1834-1910) was one of the leading marginalistveconomist from the nineteenth century who introduced the general equilibrium system. We have already talked about his contribution in developing the marginalist principles. In this lecture we talk about the general equilibrium principle.

- Marshall realized that in economics analyzing any effect of the movement in one variable on the other is difficult. Because a number of indirect channels run parallel to the direct one. Hence, conceptualizing the overall effect is difficult. Hence, Marshall concentrated on the impact on the one market keeping other variables constant. This is known as the partial equilibrium approach.

- Walras on the other hand introduced a systematic analysis of the multimarket system when the price-quantity movement in one market affects the others.

- The general equilibrium analysis tells us how resource is allocated in the production of different goods and how consumers choose to consume different goods.

- Walrasian analysis yields two major theorems known as the First and the Second Fundamental theorems of Welfare Economics.

- The **First Fundamental Theorem (FFT)** tells us that competitive equilibrium is Pareto efficient.

- The **Second Fundamental Theorem (SFT)**, on the other hand tells us that any Pareto efficient allocation can be achieved as a market solution.

- Two characteristics of decentralized allocation mechanism. First, decentralized allocation mechanism is privacy preserving. Second, it is polyarchal meaning it results from the interplay of the action of many individuals.

- Market allocation is an ideal example of decentralized allocation

- The Walrasian model particularly focuses on the Pareto optimality property of decentralized allocation. FFT answers that question.

- However, the conditions under which this occurs are quite stringent and very unlikely to get satisfied in reality. Then why is Walras important?

- Mainly for four reasons. First, the Fundamental Theorems (FT) give important insights in the competitive processes. Second, understanding FTs is important for understanding post-Walrasian paradigm. Third, these cases are often seen as the starting point of an ideal capitalist economy. Fourth, the FTs and the Walrasian paradigm in particular can be seen as an attempt to understand the conditions under which the *invisible hand* mechanism proposed by Adam Smith might work.

3.8.1 Decentralized allocation and fundamental theorem

- Two individuals me (lower case) and you (upper case).

$$u = u(x, y) \tag{1}$$

$$U = U(X, Y) \tag{2}$$

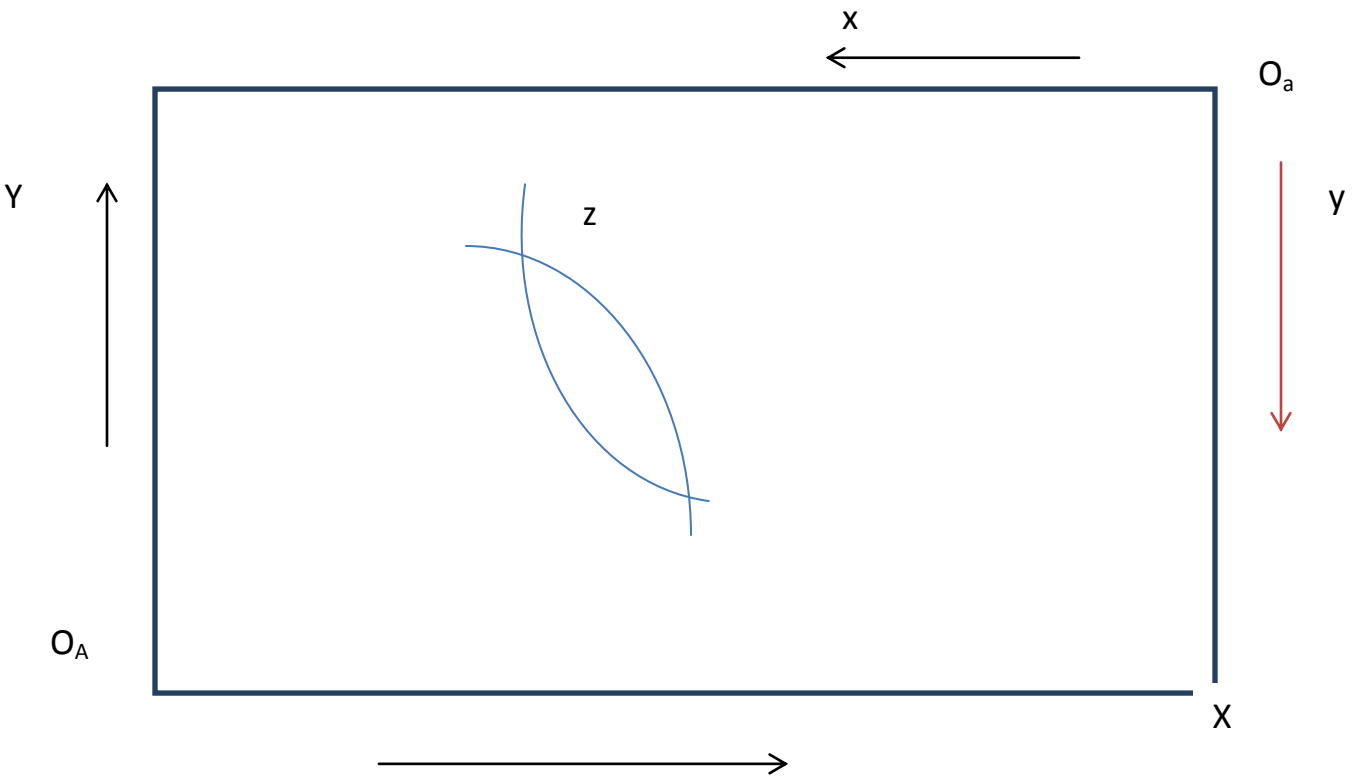
- The optimization must lead to

$$\frac{u_x}{u_y} = \frac{U_X}{U_Y} \tag{3}$$

- Allocations satisfying this condition are points on the *efficient contract locus.*

- Social planner cannot achieve this kind of solution as it involves processing a lot of information.

- Ideally competitive market achieves the same result without anyone needing to know the utility functions of anyone else.



- Assume we have an endowment of goods $\left(\underline{x},\underline{y}\right)$ and $\left(\underline{X},\underline{Y}\right)$ Suppose that is indicated by the point z in the model where $\frac{u_x}{u_y} < \frac{U_X}{U_Y}$

- Hence at z the condition for Pareto optimality is violated. This means that I will be better off by exchanging some of my x for some of your y, and you will be better off by trading some of your Y for some of my X.

- Any trade that results in an allocation lying somewhere in the lens formed by the indifference loci $U_z$and u_z, is both feasible and Pareto improving over the original endowment. Figure:

- How do we achieve this allocation? To specify a mechanism we need to specify the institutions governing our interactions.

- If you know my utility function and have the power to make a take it or leave it offer you will find the allocation that max u (your utility) at the constraint $u \geq u_z$

- If I know your utility function and can set the price at which we will exchange but not the amounts to be changed I will determine your best response to every price ratio. I might offer and max my utility subject to this constraint.

- Alternatively we may interact systematically and for knowledge of each other's utility function simply agree to any exchange that raised other utility.

- Hence the outcome depends on institutional specification.

- The Walrasian exchange process is one such institutional specification. This is competitive meaning that producers and consumers face the same prices. In the Walrasian world there exists an auctioneer who suggests different prices. This hypothetical process continues until a market clearing price is hit upon.

- We get the equilibrium condition as

$$\frac{u_x}{u_y} = \frac{U_x}{U_y} = \frac{mc_x}{mc_y} = \frac{MC_x}{MC_y} = \frac{p_x}{p_y} \quad (4)$$

- This results implies that prices implement a pareto optimal allocation.

- This result leads to the First Fundamental Theorem which can be formally stated as follows: If the exchange of goods/ services is subject to complete contracts all equilibria supported by competitive exchange is pareto optimal. Although this is based on the Walrasian system the result was formally proved by Arrow and Debreu in 1954

- The second fundamental theorem tells us that given the convexity of preference and complete market assumption any Pareto-optimal allocation can be supported as a CE for some assignment of initial endorsement.

- This implies any allocation can be achieved only by changing the initial property right and not market institution. Figure 6.2:

- It's possible to move the equilibrium from $nton'$ simply by changing $ztoz'$

- Arrow said \any complaints about [the market system's] operation can be reduced to complaint about the distribution of income [But] the price system itself determines the distribution of income only in the sense of preserving the status quotation."

3.8.2 Limitations of FFT and SFT

- Walrasian GE is not about capitalism It's highly centralized. Auctioneer in required to prevent out of the equilibrium trading. Introduction of auctioneer is radically different from the Walrasian project, which sought to determine privacy preserving and polyarchic setting.

- While explaining the equilibrium process we mention that price increases in face of excess demand.

- But if individuals are price takers in a competitive market, who does set the price to bring the equilibrium? Walras assumed an auctioneer who is missing in a realistic set up.

- We need a theory of how the process of trading transform an arbitrary initial endowment to an allocation and a vector of price that are stationary. This requires a property called quasi global stability which is not fulfilled under general condition. Because any stability condition depends on shape of excess demand functions.

- Sonnenschein showed that the usual assumptions about consumer preference and behavior impose virtually no restrictions on excess demand function. Thus auctioneer is a necessary fiction.

- Moreover, competitive equilibrium is usually not unique.

- Market completeness assumption is generally false.