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A primer in social choice theory, Wulf Gaertner, Oxford University Press, 2006, xiii + 200 pages.

The theory of social choice is concerned with the evaluation of alternative methods of collective decision-making, as well as with the logical foundations of welfare economics. Thus, it is largely about social preferences and how they might be identified. The central question of this theory concerns the possibility of deriving the objectives of a policy maker as an aggregation of the preferences of the agents in the economy, and of doing so in a manner that could be deemed satisfactory, according to a number of desiderata. It is no surprise then that the origin of this theory can be traced back to ancient times and that the theory itself had evolved until recently developing a wide spectrum of related themes. Nowadays, it is compulsory in advanced courses of undergraduate programmes, as well as graduate programmes, in economics. Nevertheless, in spite of the many remarkable monographs written by experts in the field, a proper textbook was lacking, and Wulf Gaertner has been able to fill the gap by providing an excellent one. The book covers the most fundamental contributions in the field in an accessible (albeit rigorous) way. Each chapter provides a list

of references divided in three categories (recommended reading, historical source, and more advanced), which are useful guides for readers who would like to explore further some of the topics. Some of these fundamental contributions are explored from different perspectives, which helps the reader catch their essence.

As mentioned above, a central issue within social choice theory is the so-called preference aggregation problem, which upon specifying a set of outcomes, a set of agents, and a profile of preferences, aims at associating to these data a collective preference, i.e. one that will order all outcomes according to a criterion that is endorsed by the agents collectively. The ordering is meant to reflect the level of social welfare at any one of the outcomes, including the suboptimal ones. This is truly the most general microeconomic model of collective decision-making because it makes no restrictive assumption, neither on the set of outcomes nor on the admissible preference profiles of the agents. On the other hand, the extreme generality of the model leads to a severe impossibility result, namely Arrow's impossibility theorem, which states that no social welfare function can yield rational collective preferences at every profile of individual preferences and base the collective preference between two outcomes solely on the profile of individual opinions between these two outcomes. More precisely, the theorem states that there is no method for aggregating individual rankings into a single consensus ordering that meets the following three conditions: i) if all voters rank some alternative a above another alternative b, then a is ranked above b in the consensus ranking; ii) the consensus ranking is not dictated by the same individual in all situations; iii) the relative rank of each pair of alternatives in the consensus order depends only on the individual preferences regarding that pair.

Arrow's theorem is perhaps the most important result and the seminal contribution for the modern field of social choice theory. It is therefore a wise decision to start this primer focusing on it, and it is an adequate didactic strategy to provide three different proofs for it, each highlighting an important aspect of the impossibility. Arrow's result has sometimes been interpreted to mean that there exists no satisfactory method for aggregating individual opinions into a consensus ordering. I believe that this conclusion is too pessimistic. What Arrow's result shows is that no aggregation rule satisfies all conceivable conditions. But this is not the end of the road. Chapter 3 in the book, for instance, deals with some plausible "ways out" from Arrow's impossibility. More precisely, it concentrates on the majority rule, a prominent rule in public economics that lacks an important feature within the Arrovian concept of a welfare function; namely, transitivity of the ensuing social preference relation. This is illustrated by the so-called paradox of voting, or Condorcet paradox. The majority rule, however, behaves well when we consider some restricted but important domains, such as the set of single-peaked preferences. This is precisely an

aspect over which the author of this primer has contributed extensively in the past and therefore his account here is particularly competent.

Chapter 4 mostly focuses on another influential impossibility, the so-called Paretian liberal theorem, due to Amartya Sen, which, to some extent, parallels Arrow's theorem. Even though, as clearly stated in one of the axioms leading to Arrow's impossibility theorem, it would not be appealing to have a unique individual dictating in all situations the consensus ranking from a profile of preferences, it would be desirable to allow individuals exercise some level of "local decisiveness". This was Sen's motivation to model the exercise of individual rights within the social choice context. Sen's formulation of individual rights is that of a restriction on social choice, upon allowing the existence of individual domains (of pairs of alternatives) in which each agent is decisive. Sen shows that there is no consensus ranking (generating a choice function) preserving the weak version of the Pareto principle (also considered by Arrow) and obeying what he called the "axiom of liberalism", which states that the individual domains described above exist for all agents. The chapter also deals with Gibbard's theory of alienable rights and another game-theoretic approach, developed by Gaertner himself, which might be more realistic (although, as he acknowledges, it does not suffice to heal the conflict between the exercise of personal rights and the requirement of Pareto efficiency).

Chapter 5 is for the issue of manipulability (when it is in the interest of some voter to vote differently from his or her sincere preference) and another impossibility theorem, the so-called Gibbard–Satterthwaite theorem, which states that if there are at least three alternatives, and under an unrestricted domain of individual preferences, a social choice function is either dictatorial or manipulable. As it happens with Arrow's theorem, we are now well beyond the disquieting negative message of this result. After years of research, we know of a considerable number of instances where non-trivial mechanisms can be found to be strategy-proof when defined on some domains of interest. Some of these instances are tackled in this chapter.

In Chapter 6, ways out to the three impossibility theorems described above are scrutinized upon exploiting the notion of social choice rule. An obvious start is to require less than full transitivity of the social preference relation. If so, the so-called Pareto-extension rule arises as an example of a rule combining the four original Arrovian conditions, albeit not entirely satisfactory as it creates too many equivalences. Another obvious option is to enrich the informational basis of the scheme, which suggests richer aggregation rules than the simple majority rule, such as the so-called scoring functions, the family encompassing all anonymous, neutral and consistent social choice functions. Instances of this family are the so-called Borda method, and the plurality method. Other social choice rules, such as the Kemeny ranking, are introduced in this chapter, which concludes with

a very nice real-life example (the decision procedure of the Bundestag to move the seat of Parliament and the seat of Government from Bonn to Berlin) showing how different rules (voting procedures) might lead to vastly different outcomes. Nevertheless, one of the messages from this chapter is that, in spite of these hypothetical differences, the resulting outcomes from applying different aggregation methods are not totally arbitrary.

Chapter 7 concentrates on the theories of distributive justice developed by John Rawls and John Harsanyi and what have come to be known as the leximin and utilitarian rules. Building on the classical contribution of D'Aspremont and Gevers (1977) the author shows how these rules, despite their inherent polar spirits (the former showing a concern for the worst-off, whereas the latter mostly caring about the average), share some properties. Diagrammatic proofs (which were already used in chapter 2) are employed to prove the results in this chapter.

Both Chapters 6 and 7 explore the results of enlarging the informational basis of the social decision problem, albeit in different ways. Chapter 7 focuses on the available utility information, whereas Chapter 6 on positional information within profiles. The different types of utility information they require is one of the striking differences between the Rawlsian and utilitarian approach. Utilitarianism considers gains and losses across individuals so that, if utility differences in this set-up can be formed and, in a further step, be compared interpersonally, summation becomes possible. The Rawlsian approach is ordinal but allows for a comparison of utility levels across persons. Compromises between the polar approaches of Rawlsianism and Utilitarianism that have been proposed lately (e.g. Roemer, 1998; Gajdos and Kandil, 2008) do not appear in this primer, although it might be worth allowing a potential reader the option of being referred to some of these (more advanced) references. The chapter also deals with another influential contribution by John Harsanyi, the so-called impartial observer theorem, which besides presenting some flaws (as described in the book) has proven to be a dubious fair allocation rule, due to its systematic violation of the philosophical principle of giving priority to the worst-off (e.g. Moreno-Ternero and Roemer, 2008).

Chapter 8 deals with cooperative bargaining, a theory originating (at least in its axiomatic approach) in a fundamental paper by Nash (1950), which can be claimed, along with Arrow's dissertation, as one of the seminal contributions establishing the axiomatic method in economics. Nash introduced an idealized representation of the *bargaining problem*, which is able to accommodate many real-life situations, such as the problem faced by management and labour in the division of a firm's profit, or the specification of the terms of trade among trading partners. The formal and abstract model is simple: Two agents have access to any of the alternatives in some set, called the feasible set. Their preferences

over these alternatives differ. If they agree on a particular alternative, that is what they get. Otherwise, they end up at a pre-specified alternative in the feasible set, called the disagreement point. Both the feasible set and the disagreement point are given in utility space. Nash's objective was to develop a theory that would help predict the compromise that agents would reach. The so-called Nash solution emerged as the only solution satisfying a list of axioms he formalized and it is the main focus of this chapter. Subsequent solutions, such as the so-called Kalai–Smorodinski solution, as well as the egalitarian solution, which arose as a consequence of challenging some of the original axioms proposed by Nash, are also analysed here.

Chapter 9 is concerned with the issue of empirical social choice, an interesting research programme to which the author has contributed in recent years, to extend the theory of social choice. It refers to empirical studies (mostly questionnaires) that are aimed to test the validity of some of the axioms over which some theoretical results lie. This approach, has proven to be useful to shape the theory and open up new research directions in other fields (e.g. health economics, income distribution), and it might well be the case that a similar pattern might occur here. The chapter provides a thorough appraisal of Yaari and Bal-Hillel's seminal contribution (in what happened to be the very first paper published in the journal *Social Choice and Welfare*), with a special emphasis on what is now considered the usual approach to test the validity (or, at least, the appeal) of rules to solve resource allocation problems; namely, to ask subjects to answer a questionnaire adopting the perspective of an outside observer. Yaari and Bar-Hillel concentrated on some of the rules described throughout this primer (e.g. the Nash solution and the Kalai–Smorodinsky solution with different disagreement points, the Rawlsian Maximin rule and the Utilitarian rule) showing, among other things, that framing effects matter and that, in particular, different solutions might be supported for the same distribution problem, depending on whether tastes or needs were prevalent in the story underlying each question.

The detailed account of Yaari and Bal-Hillel's seminal contribution is perhaps the best possible introduction to the emerging field of empirical social choice. Other more recent contributions within the field are mentioned here, although perhaps some influential ones are missing. For instance, Konow (2000), who examines the extent to which fairness considerations can be explained by a single fairness ideal (the liberal egalitarian principle). Also, Cappelen *et al*. (2007), who, in contrast, aim to examine the prevalence of different fairness ideals (egalitarianism, liberal egalitarianism and libertarianism) by means of analysing a dictator game where the distribution phase is preceded by a production phase. This represents a departure from the questionnaire approach as it tests a theory of distributive justice upon giving agents active roles in the allocation

process, rather than just exploring the views of an outside observer. An attempt to unify both approaches (the outsider and insider approaches) has been recently provided in the context of problems of adjudicating conflicting claims (e.g. Herrero *et al*., 2006).

The final chapter of this primer offers quick previews of other possible extensions of social choice theory (e.g. defining social choice rules in continuous space, the allocation problem among a group of agents with single-peaked preferences, the issue of freedom of choice) and whose proper appraisal would require a deeper analysis, surely beyond the scope of this primer.

The lively state of social choice theory is reflected in the good shape of the leading journal in the field (*Social Choice and Welfare*), which is expanding constantly in different directions. Actually, and somewhat related to some of my previous comments, I miss at least a reference in the last chapter of the book to some important new directions that are being developed within the theory, and that to my viewpoint are more promising than some of those described therein. Instances would be the literature on compensation and responsibility (most notably developed by Walter Bossert, Marc Fleurbaey, François Maniquet, and John Roemer, among others) which analyses the distributive implications of the idea that individuals are or should be held responsible, to some degree, for their achievements, and which therefore accounts for the concept of responsibility (absent from important strands of normative thinking for a long time). Or the theory of fair division (most notably developed by Hervé Moulin, William Thomson and Peyton Young, among others) which is concerned with the existence of allocation rules satisfying various requirements of fairness expressed in terms of resources and opportunities understood in their physical sense (and not in terms of abstract entities such as utilities or functionings), thereby encompassing the study of the allocation problem among a group of agents with single-peaked preferences mentioned above, but also touching other models such as intertemporal allocation, public good production, cost sharing, or problems of adjudicating conflicting claims.

Another new direction that social choice as a field seems to be taking is that of political economy. The birth of social choice theory provided vital impetus for the development of analytical tools to study the (economic and political) outcomes of political processes. During the last decades, the increased interest in applications has been paralleled by a surge in theoretical research aimed at developing a rigorous language and a coherent class of models to analyse political institutions and outcomes as equilibrium phenomena. Two excellent books by Austen-Smith and Banks (1999, 2005) provide systematic accounts of the social choice and game-theoretic foundations of this literature.

There is, nonetheless, an obvious line of defence against such complaints, which appeals to the essence of a primer and its limited

length. I have no doubt that the author would be quite happy if his book managed to awake the interest of potential readers sufficiently to enrich their knowledge of the theory of social choice in any of these directions.

To conclude, I would say that Wulf Gaertner's book constitutes an outstanding primer for the field of social choice that will surely become a standard reference for those wanting to be initiated in the field.

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Rationality in economics, Vernon L. Smith, Cambridge University Press, 2008, xx + 364 pages.

The methodological reflections of Nobel laureates are not always models of rigour. This is something which should be readily forgiven; winning