

SEN, AMARTYA K.

In 1998 Amartya Sen received the Nobel Prize in economics, in particular for his contributions to welfare economics and the theory of social choice. The latter area has its modern origin in Arrow's famous monograph "Social Choice and Individual Values" from 1951 (2nd edition 1963) where the author proved that under certain rather intuitive conditions, a so-called social welfare function does not exist. This negative result, often called "Arrow's impossibility result", had a huge impact on economics but also on philosophy and political science.

Sen's own reaction to Arrow's findings culminated in his monograph from 1970 "Collective Choice and Social Welfare", though in the second half of the sixties already, Sen had published a couple of fundamental articles on this topic in economics journals that emphasize the formal or mathematical approach, such as *Econometrica*, *Journal of Economic Theory* and the *Review of Economic Studies*. Sen's book which turned out to be the gateway into the field of collective decisions for many who, in the course of time, became distinguished social choice theorists, highlighted at least three fundamental aspects within the area: the informational parsimony within the Arrowian approach and various escape roads therefrom, the role of individual rights and liberties within collective decisions, and the effectiveness of the majority method and related rules under various domain conditions of voters' preferences.

The informational basis in Arrow's set-up is a set of individual ordinal preferences to be mapped into a unique social ordering. Preference intensities not only make no sense in such a framework, they cannot even be expressed meaningfully in an ordinal framework. Arrow also excluded the interpersonal comparability of preference rankings. Once ordinal preferences are combined with the possibility to compare levels of utility across persons so that it is, for example, possible to say that under a certain policy x , let's say, person i is better off than person j , the maximin or leximin rule (i.e. the lexicographic extension of maximin) à la Rawls (1971) focussing on the worst-off in society is a non-contradictory and, perhaps, attractive aggregation rule. If preferences are assumed to be cardinal so that utility differences are measurable, bargaining solutions à la Nash or Kalai-Smorodinsky may be considered as social choice rules. These are defined with respect to a status-quo point. If utilities are not only cardinal but also comparable across persons, classical utilitarianism and its modern version based on the Bayesian concept of rationality, as proposed by Harsanyi (1953, 1955, 1977), do not run into the Arrowian impossibility. In other words, the informational aspect, the degree of available utility information, is a powerful tool to distinguish among different approaches, and it was Sen in particular who made us aware of this "taxonomy" very convincingly. As we tried to argue above, Arrow's approach is parsimonious and, in a certain sense, unsuccessful, ending in a *cul de sac*.

Sen (1970 a, b) was the first to combine the mechanism of aggregating preferences with the idea that individuals or citizens within a community should be able to exercise certain personal rights. While Arrow showed the existence of a global dictator, Sen asked whether it would be possible to permit individuals to be "local dictators" over purely private matters. The latter was called a libertarian right. To the surprise of many, Sen came up with another impossibility result, the "impossibility of a Paretian libertarian". Under an unrestricted domain of individual preferences, the weak Pareto principle and the right to be individually decisive over a minimal personal sphere are incompatible. The number of papers that tried to circumvent this negative finding runs into hundreds. One can restrict individuals' rights

though Sen's requirement is already minimal, one can limit the application of the weak Pareto rule or restrict the domain of individual preferences. But are these proposals satisfactory? Sen's negative result has an analogy in non-cooperative game theory where it is well known that Nash equilibria can be Pareto inefficient.

That the majority rule can lead to cyclicity if preferences are not restricted has been known for several centuries. The Marquis de Condorcet already was suggesting ways how to get out of this dilemma. It was only around 1950 that Arrow (1951) and Black (1948) independently came forward with a domain condition on individual preferences that is not only easily interpretable but can also be witnessed in certain real-life situations, the property of single-peaked preferences. Given a certain number of alternatives arranged along the real line, individuals have a most preferred object somewhere along the line, and to the left and to the right of this object, preferences decline. This can be taken literally. One of the examples that depict this structure comes from the left-to-right structure of political parties. The mirror-image of single-peakedness is single-cavedness. Sen (1966) proposed his condition of value restriction which encompasses both properties and a third one of "not being in the middle" between the other two alternatives, given any triple of options, and showed that this condition is sufficient for the existence of a majority or Condorcet winner under the simple majority rule. If the number of voters who are not indifferent among all alternatives is odd, the simple majority rule yields a social ordering. In Arrow's terminology, under value restriction plus oddness, the method of simple majority decision is a social welfare function. Various other sufficient conditions, for example limited agreement and dichotomous preferences, such that the simple majority rule becomes an Arrow social welfare function were formulated, but space does not allow us to go into greater detail.

The aspect of informational parsimony may have led Sen, in collaboration with Mahbub ul Haq, to devise and construct the so-called human development index. This index, as a rival to GDP, was meant to serve as a more humane measure of development than a purely income-based (or commodity-based) measure like GDP, to reflect the "life chances" people have. The idea was to divert attention from the single-focus GDP indicator to aspects that are fundamental ingredients of the freedom of living and well-being. For Sen, what defines the latter are the functionings of a person, her achievements and not just the accumulation of primary goods as in Rawls' (1971) Theory of Justice. What a person manages to do or to be (for example being well-nourished, well-clothed, taking part in community life, having access to medical care) are functionings that are important for a person's life. The total number of functionings that are available to a person or household define the advantages of that person, her real opportunities. According to Sen (1985), these make up the person's capability set.

Preferences over outcomes such as commodity allocations miss what is of primary importance, namely that individuals are deeply concerned with what substantive opportunities are available to them. The opportunity set that is offered to an individual is as important to evaluating his freedom as is his autonomy in making decisions and his freedom from interferences imposed by others. Of course, measuring an individual's freedom and the capability set available to him is not an easy task – there is both a measurement problem and a shortage of reliable data – but it should be done (and has already been attempted by a number of researchers). That the GDP as a measure for well-being is largely unsatisfactory had already been demonstrated by Sen in his book "Commodities and Capabilities" from 1985 where he showed that at that time, India and China were close together in terms of gross national product per head but quite far apart in terms of criteria such as the ability to live long, the ability to avoid mortality during infancy and childhood, and the ability to read and write. All of these are of utmost importance for developing countries in particular.

An area that has not yet been mentioned in this review but which has propelled Sen's reputation and fame in third world countries is development economics. In his investigation on "Poverty and Famines" from 1981, Sen tried to shed some light on the causes of famines. The author focussed in particular on large scale famines in Africa and Asia in recent times. Frequently, famines and a drastically restricted availability of food products go hand in hand. In the large-scale famine in Bangladesh in 1974, however, there were other factors that increased the suffering of the population. Due to an earlier flooding of the country, the price of rice, a basic food product, increased considerably. At the same time, rural workers lost their occupation in large numbers since no harvest was possible in the flooded areas. Real wages fell dramatically among the rural population so that starvation took its death toll. Sen argued that in order to prevent a deterioration of the situation of those who did not possess much anyway, public interventions would have been needed. These could have taken the form of distributing cash money to the poor, starting publicly financed employment programs and even intervening in the formation of food prices. During recent decades, this recommendation was followed by a larger number of developing countries. There is still another aspect to which Sen drew attention. He asserted that multi-party democracies never witnessed serious famines. Both a free press and a functioning opposition in parliament would force the ruling party to introduce effective measures against the threat of a beginning famine.

Before proposing his capability approach, Sen offered contributions to the measurement of economic inequality and also suggested a new poverty measure. In 1974, Sen published an alternative characterization of the Gini Index which has been widely used as a measure of inequalities in income and wealth. Sen's characterization is based on an equi-distanced weighting scheme à la Borda. The new poverty measure, suggested by Sen in 1976, combined the Gini Index with two hitherto used measures, the "head-count ratio", which determines the ratio between the number of people who have an income below or equal to the poverty line and the total number of people in a country, and the "income-gap ratio" which focusses on the ratio between the average poverty gap and the poverty line. While the head-count ratio does not measure the actual distance of the individual incomes below the poverty line to this line, the income-gap ratio does not consider the absolute number of the poor. Sen combined both indexes with the Gini coefficient of the income distribution of the poor. Doing this results in an index number that reflects the exact structure of the income distribution of the poor. Analogous to Sen's axiomatization of the Gini coefficient, an ordinal weighting scheme is needed such that the weight attached to the income gap of a particular person below the poverty line is the same as the rank number of this person in the interpersonal welfare ordering among the poor.

In much of modern economics, individual agents are assumed to be fully rational, maximizing their own personal gain. Sometimes, it is said that the person, in her maximizing behaviour, considers the immediate neighbourhood as well, in other words, the family and close friends. This being conceded, it is the self-seeking behaviour which is being presumed. Sen (1977) couched the assumption of purely self-seeking behaviour into the following situation of two people who meet in the street. Here is their conversation. "Where is the railway station?" asks one of the two persons. "There", says the other, pointing at the post office, "and would you please post this letter for me on the way?" "Yes", the first person answers, determined to open the envelope and check whether it contains something valuable.

Sen states that it is often argued that economic theory of utility has too much structure. Sen's view is that there is too little structure. A person's behaviour is reduced to whether the concept of internal consistency is fulfilled. This is a property which is directly linked to

choices from different sets of options. When you choose alternative x, for example, from a larger set, and this alternative is also contained in a smaller set, then this option should be picked from the smaller set as well. Sen's example from 1997 which violates internal consistency without any trace of pathology runs as follows. Let x be an apple from a fruit basket containing this apple, another apple and the option to choose nothing. The individual to whom this fruit basket is offered picks one of the apples. Now let us suppose that a smaller basket just contains one of the two apples and nothing else. This apple is offered to our individual and the person politely says "no, thanks". Clearly, this apple, having become the only or last apple, is definitely different from being one of the two apples in the first basket.

Choices frequently depend on what else is offered on a plate – Sen calls this phenomenon "menu – dependence". The choice of a median element (for example with respect to the price of a bunch of flowers or a bottle of wine to be offered as a gift) depends on the number of available alternatives. Such a decision violates the postulate of internal consistency (Gaertner and Xu, 1999). The aspect of menu – dependence is particularly striking in one of Sen's own examples. Imagine that at a cocktail party, some other guest who you have met asks you whether you would like to come over to his flat the following afternoon, for a cup of tea or a cup of coffee or a hot chocolate. Since the conversation during the party was interesting, you gladly accept this invitation. Imagine that besides tea, coffee and hot chocolate, cocaine is offered as well. Would you accept the invitation now? Sen speaks of the epistemic value of the menu – the alternatives offered contain valuable information per se that may influence an agent's decision. This example supports Sen's assertion very convincingly that we need more and not less structure in our theories of decision making.

Sen (1997) proposes that maximization be considered ("choose an element such that in comparison no better element exists") instead of optimization ("always pick the best element from the set of available options"). Sen argues that it is often the case that the assumption of complete comparability of all objects is not fulfilled. Then a best element does not exist whereas a maximal element is always given.

The argument of incompleteness is a recurrent theme in Sen's writings, notably put forward in his most recent work, "The Idea of Justice", from 2009. In this book, Sen attempts to devise a counter-position to Rawls' theory of justice (1971). Rawls' basic claim was that a unique set of principles of justice would emerge in a so-called original position where the individual members of society are under a veil of ignorance, not knowing their place in society, i.e., their position or social status. The Rawlsian principles are meant to shape just institutions constituting the basic structure of society. Sen is very sceptical about the assumption that a unanimous agreement on one set of principles of justice will be brought about in the original position. Sen argues that there may be a plurality of reasons for justice, and if this is the case, how could one then arrive at one unique set of principles of justice?

Sen denotes the derivation of an ideal theory of justice such as the one by Rawls or, for example, the utilitarian philosophy as the transcendental approach. His own claim is "less elevated" or more humble. It is to "address questions about advancing justice and compare alternative proposals for having a more just society, short of the utopian proposal of taking an imagined jump to a perfectly just world. Indeed, the answers that a transcendental approach to justice gives...are quite distinct and distant from the type of concerns that engage people in discussions on justice and injustice in the world (for example, inequities of hunger, poverty, illiteracy, torture, racism, female subjugation, arbitrary incarceration or medical exclusion as social features that need remedying)" (Sen, 2009, p. 96). On p. 2 of his new book, Sen already formulates one of his main messages: "What is important, as central to the idea of justice, is

that we can have a strong sense of injustice on many different grounds, and yet not agree on one particular ground as being the dominant reason for the diagnosis of injustice”.

This being so, one cannot expect to arrive at a complete social ordering. Since the members of society vary to some degree in their views what a more just society should be like, we have to look for nonempty intersections among the individuals’ preference orderings, the shared beliefs of the different members of society and, from there, derive some partial ordering for society. Sen writes that “such incompleteness would not prevent making comparative judgments about justice in a great many cases...about how to enhance justice and reduce injustice” (p. 105). Sen views his approach as comparative in contrast to the transcendental framework of Rawls and others. The economist, the social choice theorist in particular, may find the comparative approach more appealing than the transcendental perspective, while the philosopher may have the opposite view.

Due to lack of space, it is impossible to discuss or at least mention all fields and topics to which Amartya Sen has been contributing. The scope of his research is impressive.

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