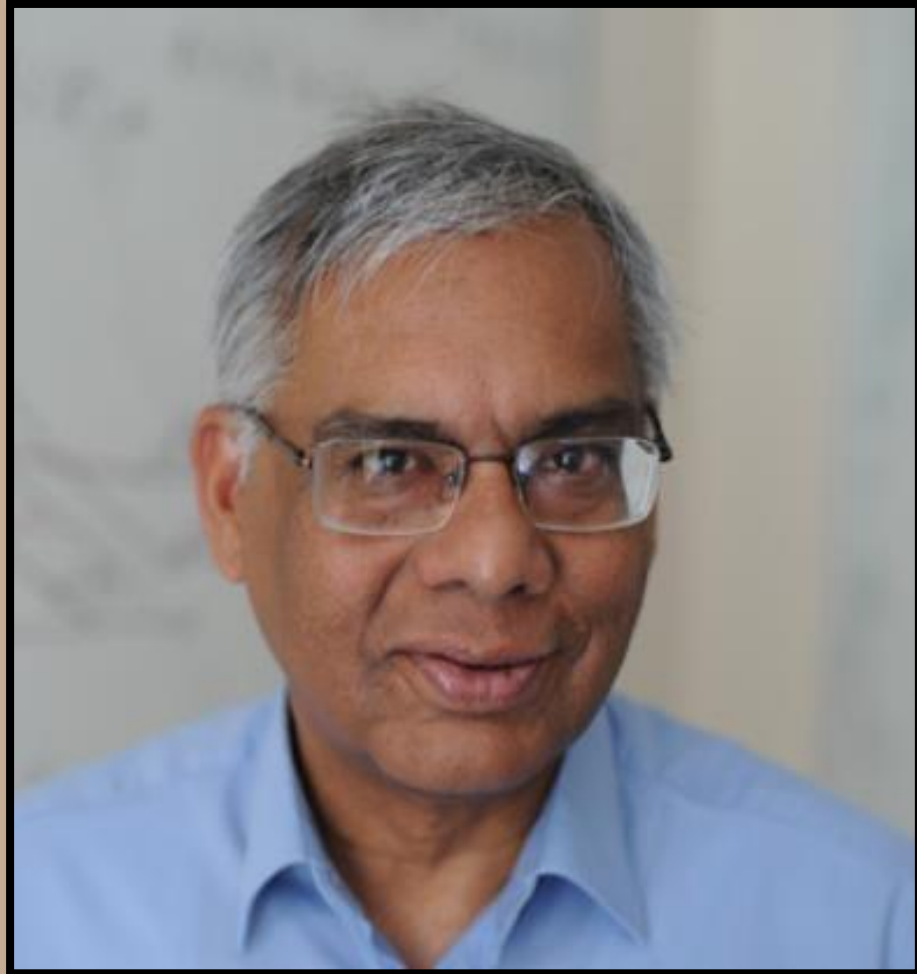


In Conversation with: **Prof. Bhaskar Dutta**



Prof. Bhaskar Dutta is a renowned economist, known for his contribution to the field of game theory and his association with Ashoka University as a Professor of Economics.

Editor: Good evening, sir! Thank you for joining us. It's really an honour to interview you today. Firstly, we'd like to ask you, what made you gravitate towards your current research interests?

Prof. Bhaskar Dutta: My PhD dissertation was on social choice theory—more on the strategic aspects of social choice theory—and when I was doing my PhD, game theory was in its infancy, which says something about my age!

So, basically, when I was doing my masters in Delhi School of Economics, there was no course on game theory. Over time I learnt it on my own. I learnt aspects of game theory which I like, on my own. I've always been interested in strategic aspects of individual behaviour and my dissertation was on strategic voting and voting rules etc.

So, it was sort of a natural transition to game theory, which also deals with individual strategy. And I guess that's about it. My main interest today, as you probably know, is in game theory and applications.

Editor: Thank you so much for answering that.

Editor: Another question we had was one drawback that is inherent from classical utilitarianism is that a world with a very large number of individuals whose welfare levels are barely above zero could have a larger sum total welfare, and therefore they would count as better off than a world which has a smaller number of individuals who are very well-off. So in a world like this, what role does the multidimensional measurement of welfare play in resolving this paradox?

Prof. Bhaskar Dutta: I'll break up my answer into two parts. One is, as you know, classical utilitarianism conventionally has been applied on a fixed population. Your question was whether classical utilitarianism can be compared or used across different population sizes, and the answer is well, yes and no. No, because of the reason you're mentioning. But that is not the context in which initial discussions of classical utilitarianism took place; that was in the context of a fixed population size.

The sum of the utilities of a large number of very poor people may be larger than that of richer individuals, if the latter group has very few people. But this is not a failure of classical utilitarianism since the two groups do not have the same number of people.

This is not to say that utilitarianism cannot be applied across variable populations; In fact, there

has been a lot of work on it. There is, if I'm not mistaken, a book on how utilitarianism can be applied to variable population sizes. I don't remember the title of the book, but I remember the names of the authors who are Charles Blackorby and David Donaldson, among others and they have a book on variable population and utilitarianism.

And there's been a lot of work on this issue. For instance, one possibility is to use average utilitarianism. So, if you have again a large number of individuals with low levels of utility that would translate into low average utility. But if you have a small number of individuals with large incomes or large utilities, then the average would be higher.

You also mentioned multidimensional measurement of welfare. There is discussion about this over time starting with the very influential work of Amartya Sen. The idea was that income or utility, income in particular, is not the only measure of individual well-being. You need to consider a basket of criteria, for instance, health, education and also of course income. So, an individual's standard of living would depend upon all these different criteria. So when you're measuring welfare then you have to take these different criteria into account and hence multidimensional measurement is the right way to go.

Editor: I just had a follow up question to ask this. In recent times, with the climate crisis, do you feel like there needs to be an inclusion of measures such as the susceptibility to climate change, etc.? Or, and even just like, more inclusion of people at the margins and consideration of how there can be differential impact of the coming crises on these people into the calculation of welfare measurements.

Prof. Bhaskar Dutta: I don't have a complete answer to this. But, to some extent this goes in the direction of multi-dimensional measurement. You need to look at, of course, climate change as more of a long-term perspective in the sense that we are worried about climate change today because of what can happen in the future. But if we take into account the welfare of future generations, then the issues of climate change can become very pertinent. Those who live in Delhi know that it also has an effect on current health for instance, but discussions on climate change have been conducted more in the context of the future well-being.

Does that sort of answer your question?

Editor: Yeah, it does.

Editor: You have stated that exchanging favours can lead to socially and economically desirable networks in one of the papers. So, do you think that this is the basis of all international

organizations or coalitions or unions? And at what point do you think that the favours could be considered returned and would it lead to the disintegration of these coalitions?

Prof. Bhaskar Dutta: The paper that you are talking about was in a very specific context - for instance, in rural societies where contracts may not be written down or enforced. So, reciprocity plays a big role in such circumstances because in a community, you may give a loan to an individual or your neighbor today because you know that in future when you need something, you will get a favour in return.

And here when I say this, I'm taking a very sort of narrow neoclassical point of view, that people are not idealistic or they don't give favours, just out of a sense of goodwill, but because they expect something in return. That happens sometimes and at other times it doesn't. In the context of international organizations, of course, if you look at, for instance, countries. I think when one country strikes an alliance with another country, it essentially does so because of its own self-interest. So self-interest, I think, is a primary driver, if you will, of individual countries' behaviour. Then, if you give a favour to another country it's because you expect it back. But, we wrote the paper more in the context of rural societies where formal contracts cannot be written down.

Editor: Sir, I just have one more follow up. So, as you said that you've stated that in the context of rural societies, do you think that the social atmosphere there is a huge factor where people are getting into oral contracts?

Prof. Bhaskar Dutta: Rural societies are also hierarchical and when there is this hierarchy I don't think this favour exchange works very well. If you're on the top of the hierarchy and if you give a favour which typically happens not very often, that's not because you expect something in return. So I think you need to interpret that piece of work in the context of relationships among equals.

Editor: In your opinion, in the presence of several other schools of thought such as neoclassical or classical economics, how did game theory formalise itself as one of the most credible fields in economics?

Prof. Bhaskar Dutta: I think Game Theory is more a part of neoclassical economics than classical economics. So what are the basic driving forces of neoclassical economics? That individuals are maximisers of their own good. They have an objective function and depending on the context it could be utility or income and they want to maximise that. This definition of

rationality is very stark. Game theory also assumes that individuals are rational and try to maximise their goals, or in terms of game theory their payoffs. How would you define payoffs? It could include consideration for others as well. Once you define the game and set strategies for each player, then players choose actions, and the collection of actions gives rise to some payoffs. And the individual chooses their strategy to try to maximise their payoffs based on conjecture on what others are going to do. Most applications of game theory are in the context of small numbers, where individual behaviour matters, and not in the context of competitive markets where there are lots of individuals. The definition of a competitive market is that there is a market price and an individual can buy and sell whatever he or she wants. My action has no consequence on the market prices. Game theory considers small numbers and there is strategic interaction.

Editor: Sir, I had a follow-up, you mentioned that when you were studying game theory it was not as formalised as it is right now and it is a relatively new field that has been popularised in economics. Do you see any other fields like this presently that will become as popularised and formalised as game theory is today?

Prof. Bhaskar Dutta: I don't know about the formalised part but certainly, behavioural economics is a very established field now. Partly because in neoclassical economics and game theory we make very extreme assumptions to the extent to which individuals maximise their own well-being or pay off. There have been lots of laboratory experiments where the conclusions that you get from a game theoretic model are not borne out. As a result of that, many people have tried to develop formal models with different behavioural assumptions since maximising behaviour doesn't fit in all contexts. Therefore, behavioural economics is a rising field in formal theoretical economics.

Editor: Another question we had was related to mechanism design, there is an institutional bound on international organizations to treat countries "fairly" or "similarly", restricting the scope and impact of climate agreements, given the personalization of costs and benefits that is often required to induce desired behaviour?

Prof. Bhaskar Dutta: Can you be a bit more specific?

Interviewer: For example, a given agreement has a fixed set of things a country has to abide by and the range of fines for not abiding is limited. Similarly, the benefits that can be given for abiding are limited because there is general agreement that countries should be treated fairly. Do you feel like this restricts the scope of climate agreements sort of conditions for reducing

emissions? Is there a greater degree of personalisation of agreement needed given the variability of costs?

Prof. Bhaskar Dutta: My understanding of negotiations on climate change in an international forum is that they have not been very successful. The main reason for this is not because countries should be treated fairly but because what is fair is not clear. For instance, developing countries would argue for a certain level of emission per head of population whereas the US would say, let's fix the total level irrespective of population size. That's where there has been a failure of agreements. With India and China being large, fixing a country-specific level of emissions becomes costly for India and China as that would mean emissions per head of population would be very small. The problem with climate change negotiations is that we don't know what's fair. Is the same level of emission fair or is the same level of per capita emission fair? A context where populations differ across countries leads to different recommendations and policy prescriptions. But this is an area where I probably know as much as you know!

Editor: Lastly, we would just like to ask you; since you mentioned yourself that when you were beginning to be interested in game theory most of what you learned about the subject, you learnt it on your own through readings, so what advice would you give to undergraduate students like us who are just beginning to be interested in the subject and any research tips that you have about how students can approach their research interests and approach complex topics like modelling behaviours in game theory.

Prof. Bhaskar Dutta: I think the first and most important piece of advice that I would give you is that you should follow your own interest as far as possible. Some people would like to be theorists; others would like to do empirical work; some would want to specialize in climate change and environment, others in trade; I'm just taking up examples. I think it is important to be not completely driven by what the market wants. So there are some topics and fields that are fashionable and often younger people try to follow the fashion. Obviously, you can't ignore it completely, whatever the hot topic is currently. But everyone has different tastes, all of us have different preferences and it is important to follow what you like. Read up on topics or subjects that you feel particularly interested in, especially at the undergraduate level. You know you're going to enter the job market many years later. So you have time to think of this is what will give me a good job. You have lots of time for that. At this stage read up on what you like, whichever field you enjoy reading about.

Editor: Thank you for that, sir.

Editor: Could you tell us about applications of game theory outside the field of economics?

Prof. Bhaskar Dutta: Game theory is not just applied in economics; it is applied across a wide spectrum of subjects. This year, I am going to teach an optional course at Ashoka University called Game theory and Applications where we would discuss applications in biology, computer science, political science and of course also economics. Game Theory provides a very powerful set of tools. So for example in biology—evolutionary biology. Have you come across the name of John Maynard Smith? He applied very simple game theoretic models to explain evolutionary biology and aspects of it. In Political science of course, the so-called hotelling model of political competition, that's a straightforward application of game theory. Computer science for instance, again is a huge field of applications of Game Theory. Let me give you one fascinating example. On Google you must have entered search words. Suppose you want to buy something, you enter let's say—pen, then you get a whole set of links, about shops and about the types of pens, etc. Some would be at the top, some would be lower down. So have you ever wondered how Google forms this list? It's actually based on online real-time auctions. Because obviously if your product is on top of the list then more potential customers are going to go to your website. So, being higher up is more valuable and you are willing to pay Google to be on the top of the list. So there is actually a real-time auction being performed in order for Google to make the list. Now all these actions, how are they designed? In fact, that is a very current topic in the field of research in game theory. So web search, all kinds of different applications in Computer science can be related to game theory.

Editor: That was highly fascinating, sir! Thank you for sparing time for us today!

