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Nobel Prize Laureates

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NOBEL PRIZE FOR ECONOMICS 2005

The 2005 Nobel Prize for Economics has been awarded to Thomas Schelling and Robert Aumann. The Swedish Academy of Science has awarded them the prize for their work on conflict and cooperation in game theory. Thomas Schelling, who was born on April 14th, 1921, in Oakland, California (USA), teaches at the Department of Economics and School of Public Policy, at the University of Maryland. Since the mid-1950s, Schelling has been applying game theories to global security and arms races. His best-known book is the 'The Strategy of Conflict' (1960). The mathematician Robert Aumann was born on June 8th, 1930, in Frankfurt am Main (Germany). In 1938 he fled with his family from Germany to the USA. Since 1956 he has been living in Israel. He teaches at the Center for Rationality at the Hebrew University in Jerusalem. Robert Aumann has provided significant contributions to cooperative game theory. He has also defined the concept of super-game, a situation which arises when setting prices on global financial markets with many market participants.

Two Very Different Researchers

Nowadays, many of the strategic interactions examined by Schelling can be formally analyzed. The illustrative examples in his work, in particular, have provided the food for thought to inspire formal game theorists and users of game theory to conduct further research. Schelling has demonstrated that it is possible

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to receive international acclaim without arguing and publishing with final analytical precision. There is hardly any branch of game theory in which Robert Aumann is not among the pioneers with his mathematical brilliance and conceptual contributions. These include, for example, utility theory, folk theorems, cooperative game theory, equilibrium concepts based on game theory, the mathematically challenging repeated games with incomplete information, the refinement of game theoretical methodology and evolutionary game theory, to mention only a few.

What makes the game theory so interesting from an economics perspective? Markets are exchange situations, i. e. they entail social decision-making situations, in which at least two economic agents act. The aim of game theory is to describe the individual rational behaviour in social decision-making situations. This makes it clear that the application of game theory is inevitable when using the rationality hypothesis.

An additional substantial contribution of game theory, among others, is that it can consistently offer justification for the traditional market solutions such as complete competition, monopoly competition, oligopoly, and monopoly in conceptual terms. This means that game theory can justify the different market solutions as variations of a single solution concept. Instead of behaviour assumptions drawn ad hoc, game theory falls back on particular market conditions, which are typical of real markets.

Here are some repeated games in which reputation is important due to asymmetric information:

Application	Sidedness	Players	Actions
Prisoners-Dilemma	two-sided	Row Column	Deny/Confess Deny/Confess
Duopoly	two-sided	Firm Firm	High Price/Low Price High Price/Low Price
Employment	two-sided	Employer Employee	Bonus/No Bonus Work/Shirk
Product-Quality	one-sided	Consumer Seller	Buy/Boycott High Quality/Low Quality
Entry-Deterrence	one-sided	Incumbent Entrant	Low Price/High Price Enter/Stay out
Financial-Disclosure	one-sided	Corporation Investor	Truth/Lies Invest/Refrain
Borrowing	one-sided	Lender Borrower	Lend/Refuse Replay/Default

To mention an additional game from macro-economics: the relationship between money and fiscal policy of national economy can be modelled as a game. Game theory demonstrates the importance of commitments. The effi-

ciency and macro-economic stability of institutional conditions of monetary and fiscal policy can be conceptualized by means of game theory.

Game theory provides insights on what the circumstances are and what the circumstances can be. On this note, game models are the formal apparatus required to make better predictions. The concept of «game» is a metaphor, which is useful for connecting areas which do not belong together at first sight. The vision of a manager of a large enterprise as a «player» in terms of game theory takes getting used to because no decision-maker will ever be so rational as he/she is assumed to be according to the game theory solution concepts (the Nash equilibrium).

Nowadays, game theory enjoys a dominant status in the social sciences. Its concepts (zero-sum game, private information, signalling, principal-agent relationship) increasingly appear in everyday life. With regard to social problems and solutions to them, game theory enables us to understand them more profoundly. However, relatively few people share the belief that game theory actually helps solve practical problems.

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