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0521814626 - Decision Making using Game Theory: An Introduction for Managers

Anthony Kelly

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## Decision Making Using Game Theory

### An Introduction for Managers

Game theory is a key element in most decision-making processes involving two or more people or organisations. This book explains how game theory can predict the outcome of complex decision-making processes, and how it can help you to improve your own negotiation and decision-making skills. It is grounded in well-established theory, yet the wide-ranging international examples used to illustrate its application offer a fresh approach to what is becoming an essential weapon in the armoury of the informed manager. The book is accessibly written, explaining in simple terms the underlying mathematics behind games of skill, before moving on to more sophisticated topics such as zero-sum games, mixed-motive games, and multi-person games, coalitions and power. Clear examples and helpful diagrams are used throughout, and the mathematics is kept to a minimum. It is written for managers, students and decision makers in any field.

**Dr Anthony Kelly** is a lecturer at the University of Southampton Research & Graduate School of Education where he teaches game theory and decision making to managers and students.

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## Preface

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**And, greatest dread of all, the dread of games!**

John Betjeman 1906–1984 'Summoned by Bells'

Game theory is the science of strategic decision making. It is a powerful tool in understanding the relationships that are made and broken in the course of competition and cooperation. It is not a panacea for the shortcomings of bad management. For managers, or those who interact with management, it is simply an alternative perspective with which to view the process of problem solving. It is a tool, which, like all others, is best used by those who reflect on their own practice as a mechanism for improvement. Chance favours a prepared mind and this book is intended as much for those who are seeking effectiveness as for those who have already found it.

Game theory has been used to great effect in sciences as diverse as evolutionary biology and economics, so books on the subject abound. They vary from the esoteric to the populist; from the pedantic to the frivolous. This book is different in a number of ways. It is designed for both students and practitioners. It is theoretical insofar as it provides an introduction to the science and mathematics of game theory; and practical in that it offers a praxis of that theory to illustrate the resolution of problems common to management in both the commercial and the not-for-profit sectors.

The book is intended to help managers in a number of ways:

- To expand the conceptual framework within which managers operate and in doing so, encourage them to develop more powerful generic problem-solving skills.
- To resolve practical difficulties as and when they occur, more efficiently and with increased effectiveness.

- To find new solutions to familiar problems that have not been satisfactorily resolved, by giving practitioners a deeper understanding of the nature of incentives, conflict, bargaining, decision making and cooperation.
- To offer an alternative perspective on problems, both old and new, which may or may not yield solutions, but which at worst, will lead to an increased understanding of the objective nature of strategic decision making.
- To help managers understand the nature of power in multi-person systems and thereby reduce the perception of disenfranchisement among those who work in committee-like structures within organisations.

The book is a self-contained, though by no means exhaustive, study of game theory. It is primarily intended for those who work as managers, but not exclusively so. Students of politics, economics, management science, psychology and education may find the approach used here more accessible than the usual format of books on the subject. No great mathematical prowess is required beyond a familiarity with elementary calculus and algebra in two variables.

Game theory, by its very nature, offers a rational perspective and, in a society that has developed an aversion to such things, this will be sufficient reason for some to criticise it. This is as unfortunate as it is short-sighted. Research suggests that good managers are well informed, multi-skilled and flexible in their approach to problem solving. Organisations themselves are increasingly complex places, which can no longer afford to live in isolation from the expectations of their employees or the wider community. More than ever, they are workplaces where managers must continuously balance opposing forces. The resulting tensions are ever-changing, and know-how, mathematical or otherwise, is often what separates a failing manager from a successful one.

It has been said, by way of an excuse for curtailing knowledge, that a person with two watches never knows what time it is! Unfortunately, managers cannot afford such blinkered luxury. Game theory has clearly been successful in describing, at least in part, what it is to be a decision maker today and this book is for those who are willing to risk knowing more.