## **CONTENTS**

List of Figures and Tables		xi
Acknowledgements		xvi
About this book		xvii
Intr	Introduction	
1.	The most famous games	1
	1.1 The coordination game	1
	1.2 Choice of standards	2
	1.3 The battle of the sexes	4
	1.4 The chicken game	5
	1.5 The prisoners' dilemma	7
	1.6 Matching pennies	12
	1.7 The ultimatum game	14
	Exercises	17
2.	Building the theory for simultaneous games	20
	2.1 The normal form game	20
	2.2 Towards a solution	22
	2.3 Some propositions on maximin strategies, rationalizable strategies and Nash equilibria	27
	2.4 Finding the Nash equilibria	29
	2.5 Complications in finding the Nash equilibria	33
	2.6 The payoffs of the game and the mixed strategies	36
	Exercises	38
3.	Static games	41
	3.1 Fiscal battles	41
	3.2 The median voter	42
	3.3 The advantage of being indifferent	45
	3.4 The broken windows theory	48
	3.5 The independence of Sylvania	50
	3.6 Cournot oligopoly	53
	3.7 Bertrand oligopoly	56
	3.8 Keeping up with the Joneses	58
	Exercises	60

## CONTENTS

4.	Dynamic games	62
	4.1 The extensive form and backwards induction	62
	4.2 The prisoners' dilemma with a previous contract	64
	4.3 Subgame perfect Nash equilibrium	66
	4.4 How to be credible (1) Eliminate strategies: Odysseus and the Sirens	69
	4.5 How to be credible (2) Acquire costly compromises: Who enters?	70
	4.6 How to be credible (3) Give up control: Separation of powers	72
	4.7 The consequences of not being credible: The healthcare game	73
	4.8 The payment of the debt	75
	Exercises	77
5.	Voting	81
	5.1 Sincere and strategic voting	81
	5.2 The manipulation of the agenda	82
	5.3 Condorcet's paradox	83
	5.4 Referendum with a minimum participation	83
	5.5 The Borda count	84
	5.6 Arrow's theorem	86
	5.7 The theorems by Gibbard–Satterthwaite and May	87
	5.8 The median voter theorem	87
	5.9 I'll scratch your back and you'll scratch mine	90
	5.10 How to know the truth: The Groves-Clarke mechanism	91
	5.11 Do we know what the people want?	94
	5.12 The discursive dilemma	95
	5.13 A referendum in Catalonia	96
	Exercises	99
6.	Negotiation games	104
	6.1 The model of offers and counteroffers	105
	6.2 Impatience	107
	6.3 Risk aversion	109
	6.4 Negotiating with fanatics	110
	6.5 Some discussion	112
	6.6 An actual case: The hijacking of the <i>Alakrana</i>	113
	6.7 The Coase theorem	114
	6.8 When not to apply the Coase theorem	116
	Exercises	118
7.	Repeated games	120
	7.1 The Christmas truce	120
	7.2 A game repeated twice	121
	7.3 Cooperation in the infinite and indefinite repetitions	123
	7.4 Some technical details	126

	7.5 Other strategies in the repeated game	128
	7.6 The cooperation in the prisoners' dilemma repeated finitely	120
	many times	130 130
	<ul><li>7.7 What experiments say</li><li>7.8 What the empirical data say</li></ul>	130
	7.9 Altruism, reciprocity and evolution	133
	7.10 Not a zero-sum game	134
	7.11 Axelrod's tournament	134
	Exercises	136
8.	Agency problems: Adverse selection	138
	8.1 The agency problem	138
	8.2 The information sets	140
	8.3 If you didn't have anything to hide you'd show me your e-mails	143
	8.4 Adverse selection in a first agency problem	146
	8.5 Adverse selection and public health systems	147
	8.6 Other examples of adverse selection	151
	8.7 Other types of adverse selection	152
	8.8 Competition reveals information: When the principal has	
	information about the agent	154
	8.9 On Rawls' original position and the ex ante criterion	155
	Exercises	156
9.	Agency problems: Signaling and moral hazard	159
	9.1 Signaling with a discrete variable	159
	9.2 The empirical evidence of education as a signal	163
	9.3 Signaling with a continuous variable and discrimination in the	
	labor market	164
	9.4 Moral hazard: Fixed payment or payment by performance?	166
	9.5 Moral hazard: Co-payment, yes or no?	170
	9.6 Moral hazard: Work in teams and cooperatives	174
	Exercises	175
10.	Seven applications of game theory	177
	10.1 The battle of the Bismarck Sea	177
	10.2 The nuclear war	178
	10.3 You cannot use information without revealing it	183
	10.4 You should bluff from time to time	184
	10.5 There may not be weapons of mass destruction:	
	Should we still attack?	187
	10.6 Is free trade a prisoners' dilemma?	192
	10.7 Negotiations between Greece and the Troika	194
	Exercises	198

## CONTENTS

11.	Seven more applications	200
	11.1 The minority language	200
	11.2 Pascal's wager	204
	11.3 The surprise exam paradox	206
	11.4 The sentence as deterrence	208
	11.5 Solidarity versus charity	213
	11.6 Single-round versus runoff elections	215
	11.7 How to eliminate illegal parking	218
	Exercises	220
12.	Dynamics	223
	12.1 Evolutionary dynamics: The hawk-dove game	223
	12.2 Imitation dynamics: A segregation model	226
	12.3 Best-reply dynamics: The emergence of language	228
	12.4 No weakly dominated strategies dynamics: Self-inflicted injuries	232
	12.5 Adaptive dynamics: Voluntary contribution to the provision	
	of public goods	235
	Exercises	237
13.	Limited rationality and behavioral economics	240
	13.1 Preferences changing with time: Which ones deserve priority?	240
	13.2 Time inconsistency and energy saving	242
	13.3 Irrationality due to the complexity of the election	244
	13.4 Irrationality due to overconfidence	245
	13.5 The age of majority	247
	13.6 Indoctrination	253
	13.7 Nudging: When to let others influence you	254
	13.8 On other irrationalities that are not so irrational	255
	13.9 Towards a behavioral theory	256
	Exercises	257
14.		260
	14.1 Cooperative and majority games	260
	14.2 Power indices in majority games	262
	14.3 Application of power indices to three parliaments	265
	14.4 Games with many quotas	270
	14.5 The distribution of power in the EU after Brexit	272
	14.6 Power indices with abstention	275
	Exercises	276
	erences	278
Ind	ex	282