

Contents

Preface	xi
----------------	-----------

Chapter One

	Game Theoretic Aspects of Gradual Disarmament	
1	Introduction	1
2	A Case When a Player Cannot Benefit in the Long Run from His Information	3
3	A Case When a Player Should Disclose His Information	10
4	A Case When a Player Should Partially Disclose His Information	11
5	The Main Theorem	22
6	The Optimal Strategy of Player 2	34
7	Conclusions	38
8	Where Do We Go From Here?	39
	Postscripts	
a	Martingales	42
b	Convexity and Concavity as Monotonicity in Information	43
c	The Error Term	44
d	Optimal Strategies of the Uninformed Player	53
e	Monotonicity of v_n and the Recursive Structure of Γ_n	61

Chapter Two

	Repeated Games with Incomplete Information: A Survey of Recent Results	
1	Introduction	65
2	Repeated Games and the Problem of Information	66

3	Lack of Information on One Side—Stage Games in Normal Form	70
	3.1 The Model	70
	3.2 Description of $\Delta_1(p)$	75
	3.3 Revealing Information	76
	3.4 The Main Theorem	78
	3.5 The Optimal Strategy of Player 1	81
	3.6 The Optimal Strategy of Player 2	87
4	Lack of Information on Both Sides	91
	4.1 The Model	91
	4.2 The Independent and the Dependent Cases	100
	4.3 Conditions Under Which a Value Exists	105
5	Incomplete Knowledge of Moves	110
	5.1 Examples	110
	5.2 The Model	122
	5.3 Revealing Information	125
	5.4 The Main Theorem	127
6	Further Problems	129

Postscripts

a	Incomplete Information on Both Sides: $\lim v_n$	130
b	Incomplete Information on Both Sides: The Limit of the Discounted Values	130
c	The Conceptual Distinction Between Γ_∞ and Γ_n : Generalities	131
d	The Conceptual Distinction Between Γ_∞ and Γ_n : Incomplete Information	136
e	Non-Zero Sum Games	137
f	Discounting	139
g	Continuous Time	140
h	Alternative Definitions of Value, Maxmin, and Minmax in Γ_∞	140
i	Incomplete Information on Both Sides: The Dependent Case	143
j	Incomplete Information on One-and-a-Half Sides	145

Chapter Three**A Formal Information Concept for Games
with Incomplete Information 155****Chapter Four****Repeated Games of Incomplete Information:
The Zero-Sum Extensive Case**

1	Introduction	175
2	Motivation	176
3	The Mathematical Model	177
4	Examples	181
5	The Infinite-Stage Game and its Relation to the n -Stage Games	186
6	Statement of the Main Theorem: The Value of the Infinite-Stage Game	188
7	Proof of the Main Theorem	191

Postscripts

a	Monotonicity of v_n and the Informed Player's Information Matrices	206
b	Remembering One's Own Moves	211
c	Optimal Strategies for the Uninformed Player	212
d	The Case When P2 Knows His Payoff	212
e	The Error Term	213
f	Incomplete Information on Both Sides	215
g	Both Players Have Incomplete Information and Know Their Own Payoffs	216
h	Identical Information	216
i	Games Without a Recursive Structure	219

Chapter Five**Repeated Games of Incomplete Information:
An Approach to the Non-Zero-Sum Case**

1	Introduction	223
2	Equilibrium Points and Equilibrium Payoffs in a 2-Player One-Shot Game	226

3	Equilibrium Payoffs of an Infinitely-Repeated 2-Player Game with Complete Information	233
4	Repeated Games with Incomplete Information	240
5	The Possibility of Cheating	257
6	Joint Plans	260
7	More Equilibrium Points	269
8	More Equilibrium Payoffs	277

Postscripts

a	Existence of Equilibria	294
b	The Folk Theorem and Individual Rationality	294
c	Characterization of Equilibria: Background	294
d	Characterization of Equilibria: Geometric Preliminaries	296
e	Characterization of Equilibria: Precise Formulation	298
f	Characterization of Equilibria: Outline of Hart's Proof	301
g	An Economic Example Requiring Unboundedly Many Communications	311
h	Known Own Payoffs	320
i	Communication Equilibria	320
j	Perturbations	321

Bibliography	323
---------------------	------------

Index	335
--------------	------------