Koji Okuguchi • Ferenc Szidarovszky

The Theory of Oligopoly with Multi-Product Firms

Second, Revised and Enlarged Edition

With 9 Figures



Table of Contents

1	Introduction	1
2	Oligopoly Games and Their Extensions	3
2.1	The Cournot Model	
2.2	Models with Product Differentiation	7
2.3	Multiproduct Models	
2.4	Group Equilibrium Problems	10
2.5	Rent Seeking Models	
2.6	Labor-Managed Oligopoly	14
2.7	Oligopsony	14
2.8	Two-Stage and Multi-Stage Oligopolies	15
2.9	A Hierarchical Model	17
2.10	Supplementary Notes and Discussions	18
3	Existence and Uniqueness Results	
3.1	Existence Results for Multiproduct Oligopoly	
3.2	Relation of Equilibrium Problems	
	to Fixed Point and Nonlinear Complementarity Problems	
3.3	Uniqueness and Properties of Equilibria	
	in the Classical Game	
3.4	Linear Oligopoly Models	
3.5	Numerical Methods for Finding Cournot-Nash Equilibria	43
3.6	Existence of Equilibrium in Rent Seeking Games	
3.7	Existence of Equilibrium in Labor-Managed Oligopolies	
3.8	Existence of Equilibrium in Oligopsony	
3.9	Supplementary Notes and Discussions	
4	Dynamic Oligopoly with Discrete Time Scale	
4.1	Cournot Expectations	
4.2	Adaptive Expectations	73
4.3	Sequential Adjustment Processes	
4.4	Extrapolative Expectations	

v

4.5 Oligopoly with Market Saturation	03
4.6 Quasioptimal Output Selections	14
4.7 Production Adjustment Costs	21
4.8 Dynamic Rent Seeking Oligopolies	27
4.9 Dynamic Labor-Managed Oligopolies	33
4.10 Dynamic Oligopsonies	37
4.11 Supplementary Notes and Discussions	42
5 Dynamic Oligopoly with Continuous Time Scale14	45
5.1 Classical Results	46
5.2 Adaptive Expectations	51
5.3 Extrapolative Expectations	63
5.4 Oligopoly with Market Saturation	66
5.5 Production Adjustment Costs	69
5.6 Dynamic Rent Seeking Oligopolies	70
5.7 Dynamic Labor-Managed Oligopolies1	72
5.8 Dynamic Oligopsonies	74
5.9 Supplementary Notes and Discussions	76
6 Extensions and Generalizations	79
6.1 Quadratic Games Under Discrete Time Scale	79
6.2 Quadratic Games Under Continuous Time Scale	93
6.3 Nonlinear Oligopolies Under DiscreteTime Scale	96
6.4 Nonlinear Oligopolies Under Continuous Time Scale	10
6.5 Supplementary Notes and Discussions	29
7 Applications	31
7.1 Network Oligopolies	31
7.2 Taxation	34
7.3 Water Resources Applications	40
7.4 An Oligopoly Model of Commercial Fishing	42
7.5 Controllability in Oligopolies	50
	00
7.6 Supplementary Notes and Discussions	54
7.6 Supplementary Notes and Discussions .2 References .2	54 55