

Contents

Part I Networks

1	Comparing Traffic Discrimination Policies in an Agent-Based Next-Generation Network Market	3
	Simon Diedrich and Fernando Beltrán	
1.1	Introduction	3
1.2	Network neutrality and traffic discrimination	4
1.3	An agent-based simulation model of traffic management in all-IP networks	6
	1.3.1 Consumer behaviour	8
	1.3.2 Provider strategies	10
1.4	Simulation and experimental design	11
1.5	Results	12
1.6	Conclusion	13
	References	14
2	Transformation Networks: A study of how technological complexity impacts economic performance	15
	Christopher D. Hollander, Ivan Garibay, Thomas O'Neal	
2.1	Introduction	15
2.2	Resource-Based Agents and Transformation Networks	17
2.3	Experimental Setup	18
2.4	Results and Discussion	19
	2.4.1 Results	19
	2.4.2 Discussion	23
2.5	Conclusion	24
	References	25
3	Contagion and Bank Runs in a Multi-Agent Financial System ...	27
	Davide Provenzano	
3.1	Introduction	27

3.2	The model	29
3.2.1	The financial network	29
3.2.2	The banking system	30
3.2.3	Depositors' behavior	31
3.2.4	Liquidity transfers and bank's bankruptcy	31
3.2.5	Withdrawals and contagion spread	32
3.3	Network structures	33
3.3.1	Complete interbank market	33
3.3.2	Incomplete interbank markets	33
3.4	Simulations	33
3.4.1	Simulation settings	35
3.4.2	Results	36
3.5	Conclusions	38
	References	38
4	Innovation niche stability with a short-term policy intervention..	39
	Antonio Lopolito, Piergiuseppe Morone and Richard Taylor	
4.1	Introduction	39
4.2	Sketching the theoretical background	40
4.3	The model specification	41
4.3.1	The expectation mechanism	42
4.3.2	The power mechanism	43
4.3.3	The knowledge mechanism	44
4.3.4	Agents of change: modelling policy action	44
4.4	Preliminary findings	45
4.5	Conclusions	49
	References	50
 Part II Macroeconomics		
5	Dynamics of probabilistic labor markets: statistical physics perspective	53
	He Chen and Jun-ichi Inoue	
5.1	Introduction	53
5.2	Model systems	54
5.3	Non-linear map for the aggregation probability	57
5.4	Ranking frozen line	58
5.5	Global mismatch measurement	59
5.6	Aggregation probability at 'high temperature'	60
5.6.1	The high temperature expansion	60
5.6.2	Analytic solution for unemployment rate	62
5.7	Summary	64
	References	64

6 Integrating the housing market into an agent-based economic model 65
 Einar Jón Erlingsson, Marco Raberto, Hlynur Stefánsson, and Jón Thór Sturluson

6.1 Introduction 65

6.2 The artificial economy 68

6.2.1 Consumption and the wealth effect 68

6.3 The housing market 69

6.3.1 Supply and demand formation 69

6.3.2 Housing market matching 70

6.3.3 Financing of housing 70

6.4 Analysis of results 71

6.5 Concluding remarks 73

References 75

Part III Finance

7 Inequality and Financial Markets - A Simulation Approach in a Heterogeneous Agent Model 79
 Thomas Fischer

7.1 Introduction 79

7.2 The Model 80

7.3 Simulation Results 84

7.3.1 A Theoretical Primer for the Static Version 84

7.3.2 The Role of the Behavioral Consumption Function 85

7.3.3 The Effect of Income Inequality on Macroeconomic and Financial Stability 87

7.4 Outlook 89

References 90

8 Risk Aversion Impact on Investment Strategy Performance: A Multi Agent-Based Analysis 91
 Olivier Brandouy, Philippe Mathieu, and Iryna Veryzhenko

8.1 Introduction 91

8.2 The advantages of the proposed heterogeneous multi-agent model .. 92

8.3 Simulations design and results 94

8.3.1 Ecological Competition Analysis of Strategy Performance .. 98

8.4 Conclusion 101

References 101

9 The shark game: equilibrium with bounded rationality 103
 Lucian Daniel Stanciu-Viziteu

9.1 Introduction 103

9.2 The model 105

9.3 Results 107

9.4 Conclusions 110

References	110
Part IV Industrial organization	
10 A stylized model for the continuous double auction	115
Tijana Radivojević, Jonatha Anselmi and Enrico Scalas	
10.1 Introduction	115
10.2 An Elementary Model for the Continuous Double Auction	116
10.2.1 Description of the model	116
10.2.2 An exact result	118
10.3 Monte Carlo Simulations	119
10.4 Summary	122
References	123
10.5 Appendix	123
11 Sense making and information in an agent-based model of cooperation	127
Caterina Cruciani, Anna Moretti and Paolo Pellizzari	
11.1 Introduction	127
11.2 The model	130
11.3 Results	132
11.3.1 Heterogeneity in contributions	133
11.3.2 Increasing information	134
11.3.3 Sense making	135
11.4 Conclusions	137
References	138
12 Comparing system-marginal-price versus pay-as-bid auctions in a realistic electricity market scenario	141
Eric Guerci and Mohammad Ali Rastegar	
12.1 Introduction	141
12.2 ACE Model	143
12.2.1 Market model	143
12.2.2 Grid model	144
12.2.3 Agent model	145
12.2.4 Learning model	147
12.3 Results	148
12.4 Conclusions	151
References	152
13 Heterogeneous Learning in Bertrand Competition with Differentiated Goods	155
Dávid Kopányi	
13.1 Introduction	155
13.2 Market Structure	156
13.3 Learning Methods	157

13.3.1 OLS Learning 157

13.3.2 Gradient Learning 158

13.4 Heterogeneous Learning 159

13.5 Competition Between Learning Rules 161

13.6 Conclusion 164

References 164

Part V Management

14 Talent management in triadic organizational architectures 169

Marco LiCalzi and Lucia Milone

14.1 Introduction 169

14.2 The model 170

14.3 Comparison of organizational architectures 171

14.4 Results for the exemplar 173

14.4.1 The exemplar 173

14.4.2 Ranking architectures 174

14.4.3 Placement within architectures 176

14.5 Validation and robustness 178

References 181

15 Multi-dimensional information diffusion and balancing market supply: an agent-based approach 183

Sjoukje A. Osinga, Mark R. Kramer, Gert Jan Hofstede and Adrie J.M. Beulens

15.1 Introduction and background literature 183

15.2 Problem definition 185

15.3 Model 185

15.3.1 Agent-based properties 187

15.4 Simulations 188

15.5 Results 189

15.6 Conclusion and discussion 192

References 193

16 Rural landscapes in turbulent times: a spatially explicit agent-based model for assessing the impact of agricultural policies 195

Marleen Schouten, Nico Polman, Eugène Westerhof, and Tom Kuhlman

16.1 Introduction 195

16.2 Spatially Explicit Rural Agent-based model (SERA) 197

16.2.1 Purpose 197

16.2.2 State variables and scales 197

16.2.3 Process overview and scheduling 198

16.2.4 Design concepts 200

16.2.5 Initialization and input data 201

16.2.6 Submodels 201

16.3 Implementation and selected simulation results 203

16.3.1	Comparing two auction mechanisms	203
16.3.2	Experimenting with buyer and seller surplus	205
16.4	Conclusion	205
	References	206
17	Interactions among biases in costing systems: A simulation approach	209
	Stephan Leitner	
17.1	Introduction and Research Question	209
17.2	Simulation Model	210
17.2.1	Model of the costing system	210
17.2.2	Investigated types of biases	214
17.3	Results	215
17.3.1	Simulation experiments and data analysis	215
17.3.2	Interactions among biases and impact on information quality	216
17.3.3	Sensitivity of results to costing system parameterization ...	217
17.4	Discussion and conclusion	219
	References	220
Part VI Methodological issues		
18	Initial Predictions in Learning-to-Forecast Experiment	223
	Cees Diks and Tomasz Makarewicz	
18.1	Introduction	223
18.2	Testing methodology	226
18.3	LtF initial expectations	229
18.4	Conclusions	234
	References	234
19	Small sample bias in MSM estimation of agent-based models	237
	Jakob Grazzini, Matteo Richiardi and Lisa Sella	
19.1	Introduction	237
19.2	The Bass model	239
19.3	The AB version	240
19.4	Estimation	240
19.5	Small sample bias	243
19.6	Conclusions	243
	References	245



<http://www.springer.com/978-3-642-31300-4>

Managing Market Complexity

The Approach of Artificial Economics

Teglio, A.; Alfarano, S.; Camacho-Cuena, E.; Ginés-Vilar,
M. (Eds.)

2013, XX, 247 p. 73 illus., Softcover

ISBN: 978-3-642-31300-4