

# Contents

1.	Introduction: Reasons for Writing this Book, a Decision Theory Approach.....	3
1.1.	Introduction .....	3
1.2.	Why the Structure of This Book – a Decision Theory Approach .....	13
2.	Nonlinear Models for the Labour Market.....	23
2.1.	Introduction .....	23
2.2.	Nonlinear Models and Examples for the Labour Market .....	24
2.3.	Conclusion .....	30
3.	Second Order Effects in Population Migration.....	33
3.1.	Nonlinear Migration Behaviour .....	33
3.2.	Cases of Reverse Migration .....	35
3.3.	A (Not So) Simple Model .....	35
3.4.	Results .....	39
3.5.	Conclusion .....	41
4.	Cities: Reactors for Economic Transactions.....	45
4.1.	Transaction Environment .....	45
4.2.	Diffusion Equation .....	47
4.3.	The Reflector (Albedo) .....	56
4.4.	Decrease in Income .....	58
4.5.	Dynamic Evolution Equation .....	60
4.6.	Conclusion .....	62
	Annex 4.1 .....	62
A.4.1.	The Coefficient K .....	62
5.	Considerations on the Reform in the Power Sector (Avoiding Chaos in the Path to an Optimal Market Structure) .....	71
5.1.	Introduction .....	71
5.2.	From Power Sector to Power Market .....	73
5.3.	Non-linear Effects in Market Penetration .....	81

5.4.	Conclusion .....	86
	Appendix 5.1 .....	87
6.	A Model of Non-linear Dynamics in the Implementation of Decisions for the Evolution of Energy Technologies .....	93
6.1.	Introduction .....	93
6.2.	Description of the Model .....	94
6.3.	Criteria for Energy Development Strategies .....	100
6.4.	An Energy Planner's Perception of Risks and Benefits .....	102
6.5.	Numerical Examples .....	104
6.6.	Energy Policy and Technological Profile .....	106
6.7.	Perception of Alternatives and Strategic Conduct .....	107
7.	Non-linear Effects in Knowledge Production.....	111
7.1.	Implementation of New Technologies .....	112
7.2.	Essentials of Chaotic Behaviour .....	115
7.3.	Complex Cyclical Patterns .....	116
7.4.	The Industrial Production and the Production of Technologies ....	116
7.5.	Measuring Technological Information and Entropy .....	121
7.6.	Conclusion .....	124
8.	Institutional Structures as Benard–Taylor Processes .....	129
8.1.	Epistemic Sense and Ontological Sense .....	129
8.2.	Social Reality and Collective Behaviour .....	129
8.3.	Dynamics of Memes .....	130
8.4.	Conclusion .....	135
9.	Oscillatory Processes in Economic Systems.....	141
9.1.	Cycles in Dynamics of Economic Systems .....	141
9.2.	Optimality Conditions and Associated Equations .....	143
9.3.	Production Potential and Quantization .....	145
9.4.	Oscillatory Behaviour – Some Numerical Results .....	148
9.5.	Conclusion .....	150
	Appendix 9.1. Second-order Systems .....	150
10.	Final Thoughts on a Different Way of Looking at Economic Processes .....	155
	General References .....	159
	Index .....	167