Contents

List of Figures	vii
List of Tables	
List of Contributors	x
List of Project Partners	xi
Acknowledgement	xiii
PART ONE THEORETICAL BACKGROUND	
1 The Self-Organisation of Innovation Networks:	
Introductory Remarks	3
Günter Küppers and Andreas Pyka	
2 Complexity, Self-Organisation and Innovation Networks:	
A New Theoretical Approach Günter Küppers	22
PART TWO CASE STUDIES	
3 Innovation Networks by Design: The Case of Mobile VCE Janet Vaux and Nigel Gilbert	55
4 Innovation Networks in the Biotechnology-Based Sectors	75
Andreas Pyka and Paolo Saviotti	
5 The Role of Knowledge-Intensive Business Services (KIB	
in e-Commerce	108
Paul Windrum	

itents
Ì.

6	Innovation Networks and the Transformation of Large Socio-Technical Systems: The Case of Combined Heat and Power Technology K. Matthias Weber	133
P	ART THREE SIMULATION	
7	Simulating Innovation Networks Andreas Pyka, Nigel G. Gilbert and Petra Ahrweiler	169
8	Evaluating Innovation Networks Petra Ahrweiler, Simone de Jong and Paul Windrum	197
PA	ART FOUR CONCLUSIONS	
9	Conclusions Günter Küppers and Andreas Pyka	215
At	uthor Index	224
Sı	ıbject Index	227

List of Figures

4.1	Building up of a knowledge base in biotechnology	80
4.2	Increasing technological space	84
4.3	Probability of birth of innovation networks	85
4.4	Flow chart	92
4.5	Number of innovations	93
4.6	Average age of the industry life cycle	93
4.7	Environmental conditions	94
4.8	Network density	95
4.9	The building up of technological competencies by LDFs	95
4.10	Accumulation of innovation probabilities	96
4.11	Composition of co-operations	97
4.12	Strategy choices	98
4.13	Network structure for selected periods	100
4.14	Collaborations in the biotechnology-based industries	101
	Average distance in the artificial world	102
	Average distance in the real world	102
	Network centralisation index of the artificial world	103
4.16b	Network centralisation index of the real world	103
4.17a	Degree of centrality in the artificial world	104
	Degree of centrality in the real world	104
5.1	A web company's view of an e-commerce innovation network	111
5.2	G7 countries comparison of the proportion of businesses	
	(weighted by business size) possessing a website, intranet,	
	extranet, and trading online in per cent	113
6.1	Graphical representation of the conceptual framework	137
7.1	Kene	174
7.2	From an actor's kene (a) to the innovation hypothesis (b)	174
7.3	Learning and forgetting represented in expertise levels	175
7.4	Incremental research	177
7.5	Knowledge exchange in a bilateral co-operation	179
7.6	The structure of the model	181
7.7	Number of firms in the VCE experiment	184
7.8	Percentage of co-operating firms	184

7.9	Another VCE simulation experiment	185
7.10	Development of capital stocks in the VCE experiment	186
7.11	Final capital stock distribution in the VCE experiment	187
7.12	Maximum and average innovation rewards	188
7.13	Variance of knowledge bases in the VCE experiment	188
7.14	The number of firms in the BioTech experiments	189
7.15	Final capital stock distribution in the BioTech case	190
7.16	The development of capital stocks in the BioTech experiments	191
7.17	Percentage of co-operating firms in the BioTech case	192
7.18	Percentage of successful innovations in relation to innovation	
	hypotheses submitted	192
8.1	Results for number of actors	208
8.2	Access points for computer simulation in the policy process	211

List of figures

viii

List of Tables

3.1	Common terms of accountability in different institutional	
	contexts	71
6.1	Comparative overview of CHP in the UK, Germany and	
	the Netherlands	140
6.2	Importance of selected circular causalities in the three	
	CHP country studies	156
6.3	The role of networking and structural measures for CHP	157
7.1	Parameter settings in the VCE case and the BioTech case	182
8.1	The parameters of the simulation model	204