

30th International Conference of the System Dynamics Society 2012

**St. Gallen, Switzerland
22-26 July 2012**

Volume 1 of 5

ISBN: 978-1-62276-414-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2012) by the System Dynamics Society
All rights reserved.

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the System Dynamics Society
at the address below.

System Dynamics Society
Milne Hall 300, Rockefeller College
135 Western Avenue
University at Albany
Albany, New York 12222

Phone: (518) 442-3865
Fax: (518) 442-3398

office@systemdynamics.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Volume 1

Model of Drivers of Fear-Induced Consumer Avoidance Behaviors Post-Incident	1
<i>Munaf Aamir, Vanessa Vargas</i>	
Towards an Optimal Rate of General Budget Support in Developing Countries	23
<i>Yaw Adom-Mensah</i>	
Pilot Error? Managerial Decision Biases Against Concurrency As Explanation for Delays in New Aircraft Development Programmes	24
<i>Henk Akkermans, Kim Van Oorschot</i>	
Teaching Resource Management with Web-Based Models and Multi-Player Games	25
<i>Stephen Alessi, Birgit Kopainsky, Erling Moxnes</i>	
Measuring Group Model Building Intervention Impact Through Preference Elicitation	42
<i>Victor Alexiev</i>	
POLLEN Learning Lab to Improve the Public Education System and PISA	58
<i>Pedro Dagoberto Almaguer Prado, Ramiro Luis Almaguer Navarro, Ruth Raquel Almaguer Navarro, Pedro Dagoberto Almaguer Navarro, Beatriz Eugenia Navarro Vazquez</i>	
An Exploration of the Added Value of Systems Analysis and System Dynamics for Assessing the Importance of Innovative Concepts	84
<i>Mónica Altamirano, Karen Meijer, Lija Van Vliet, Arjen Ros</i>	
Serving the Long-term Care Needs of an Aging Population	102
<i>John Ansah, Robert Eberlein, Sean Love, James Thompson, David Matchar</i>	
Simulating the Impact of Long-term Care Policy on Family Eldercare Hours	103
<i>John Ansah, David Matchar, Sean Love, Rahul Malhotra, Angelique Chan, Robert Eberlein</i>	
Stocks of Knowledge and Organizational Performance: A Dynamic Relationship	104
<i>Fernando Arenas</i>	
Military Workforce Dynamics and Planning in the Italian AirForce	123
<i>Stefano Armenia, Andrea Centra, Vittorio Cesarotti, Angelo De Angelis, Clarissa Retrosi</i>	
Policy Modeling for Greenhouses Gas Emissions on Dairy Cattle Sector: The Importance of the Milk Production Improvement	161
<i>Alberto Stanislao Atzori, David Ford, Luis Tedeschi, Antonello Cannas</i>	
Analysing the Uncertain Future of Copper with Three Exploratory System Dynamics Models	177
<i>Willem Auping, Erik Pruyt, Jan Kwakkel</i>	
Organizational Learning Effects in Productivity: A Dynamic Hypothesis Proposal for Shipyard Learning	202
<i>André Baitello, Marcelo Ramos Martins</i>	
Games for Learning in Freight Transportation Systems	211
<i>Zahir Balaporia, Mike Zeimer</i>	
Matching Role Playing, Balanced Scorecards and System Dynamics Modelling in Management Training: the “Strategic Micro-Factory”	224
<i>Federico Barnabe, Cristiano Busco, Maurizio Lambri, Gianfranco Zatta</i>	
Developing Business Simulation Games for a Mainstream Audience	247
<i>Michael Bean</i>	
Understanding Urban Quality of Life and Sustainability: Model Development and Validation	257
<i>Abby Beck, Krystyna Stave</i>	
Organizational Participation in Cooperative Cyber Security	279
<i>Asmeret Bier</i>	
Knowledge Management and Related Emerging Issues in Organizations: A Systems Thinking using Feedback Loop Analysis	291
<i>Sumant Bishwas, Sushil Sushil</i>	
Services as an Alternative Path to Sustainability	309
<i>Marios Bisilkas, Aurora Garcia-Gallego, Ivan Barreda Tarrazona</i>	
A Model of the Sustainability Requirements Dynamics for New Product Development	349
<i>Marios Bisilkas, Ivan Barreda Tarrazona, Aurora Garcia-Gallego</i>	
Cortisol Dynamics in Various Stress-Related Disorders	381
<i>Gustav Bizik, Marek Susta</i>	
Oil Policy Regret Analysis With System Dynamics Models	382
<i>Frank Blaskovich</i>	

Is it Really Greener in the Cloud? An Investigation of Energy Trends in Cloud Computing	391
<i>Chris Browne, Haley Jones, Paul Compston</i>	
Expansion Economies: The Growth of the Firm through its Globalization	406
<i>Fernando Buendia</i>	
The Reward System in Art Markets: A System Dynamics Approach	414
<i>Fernando Buendia</i>	
Spore: An Action-Learning Support System for Incubating Regional Cooperative Innovation Networks	431
<i>Enrique Campos-Lopez, Alena Urdiales-Kalinchuk, Arturo Inda-Cunningham, Helue De La Barrera-Gomez, Avelino Hernandez-Corichi</i>	
Making Progress Towards Defossilisation: Modelling Low-carbon Policy for Power Generation	459
<i>Laura Cardenas, Isaac Dynner, Carlos Franco</i>	
Midday in Athens. A Socratic Dialogue about Systems	460
<i>Augusto Carena</i>	
ERM Quantitative Risk Analysis Methods and Techniques Applied to a Small Commercial Bank	480
<i>Ricardo Chaim, Murilo Castellano</i>	
High-Value Outsourcing: Impact of Team Structure and Capabilities on Complex and Uncertain Offshoring Projects	513
<i>Saikat Chaudhuri, Abhijit Mandal</i>	
Research on Make Or Buy Decision Making Strategy Using System Dynamics: Focused on Korea's Military Improvement Project	534
<i>Jeong Hwan Choi, Seongpil Ko, Jeong Dong Lee</i>	
Retail Sales Generation: A Methodological Comparison of Econometric Estimation and Calibration	551
<i>Howard Hao-Chun Chuang, Rogelio Oliva, Olga Perdikaki</i>	
Students as System Thinkers: Scaling-up and Sustaining Innovations in Schools	563
<i>Meagan Colvin, Peter Hovmand</i>	
A Competitor's Strategy Unclothed: How Indirect Measurement Justified Not Fighting an Insurance Price War	564
<i>Stan Corcoran, Alan Graham, William Arthur, David Peterson</i>	
Planning and Management of Regional Infrastructure for Tourism Development in Orissa State, India	591
<i>Dillip Das</i>	
Revisiting the Roberts-Levin Patient Dropout Model	610
<i>Vincent De Gooyert, Christian Erik Kampmann</i>	
Dutch Social Housing Sector Reforms: Exploring the Effects on Low Income Households	633
<i>André De Groen, Erik Pruyt, Harry Boumeester</i>	
Forecasting the Diffusion of a Mobile Service for Freight Distribution	656
<i>Alberto De Marco, Anna Cagliano, Carlo Rafele</i>	
The Rise and Fall of the U.S. Homicide Rate towards the End of the 20th Century - A System Dynamics Approach	683
<i>Kaveh Dianati, Roland Maximilian Happach</i>	
An Interview Protocol for Assessing Students' Understanding of Dynamically Complex Environmental Problems	711
<i>Zerrin Doganca, Ali SAYSel</i>	
Power Generation Capacity Planning Under Ecological, Security and Economic Criteria: The Mexican Case	719
<i>Rogelio Domenge Munoz</i>	
An Extended SIR Model to Explore the Impact of Syndromic Data Sources on Social Distancing Policy	736
<i>Jim Duggan</i>	
A System Dynamics Approach to Assess Global Climate Change in Quantity/Quality Water along the U.S.-Mexico Trans-Border Region	751
<i>Jorge Duran Encalada, Erick Bandala, Alberto Paucar-Caceres</i>	
Chronological Aging in Continuous Time	752
<i>Robert Eberlein, James Thompson, David B. Matchar</i>	
Uncertainties in the Development of Unconventional Gas in the Netherlands	774
<i>Sibel Eker, Cornelia Van Daalen</i>	
Extracting Variables and Causal Links from Interview Data	795
<i>Ezzat El Halabi, Matthew Doolan, Michael Cardew-Hall</i>	
Offshore IT Outsourcing between India and New Zealand: A Qualitative System Dynamics Model	814
<i>Arun Elias, Saji Mathew</i>	

A System Dynamics Simulation Model for Scalable-capacity Manufacturing Systems	825
<i>Shady Elmasry, Mohamed Shalaby, Mohamed Saleh</i>	
Dynamics of Reconstruction Projects	843
<i>James Enos</i>	
Learning with Loops: Applying Feedback to Teaching System Dynamics to Undergraduates	855
<i>James Enos</i>	
A System Dynamics Model of a Local Economy with Bi-Currency System	878
<i>Aysen Eren</i>	
Model Conceptualization for Sustainable Waste and Resource Management Policy Design in Low and Middle-Income Countries through Dynamic Modeling and Simulation	893
<i>Nicolas Escalante</i>	
Collected System Dynamics Works on Recent Real Estate Dynamics	912
<i>Martijn Eskinasi</i>	

Volume 2

A System Dynamics Model to Achieve Sustainable Production of Oil in Iran	923
<i>Gholamreza Eslamifar, Amir Mohammadshirazi, Ali Mashayekhi</i>	
Using System Dynamics to Create Durable Business Strategy- US Air Conditioning Industry Case Study	953
<i>Warren Farr</i>	
A Critical Review of the Criticisms of System Dynamics	980
<i>Charles Featherston, Matthew Doolan</i>	
Stock-flow Failure Can Be Explained by the Task Design	993
<i>Helen Fischer, Christina Degen</i>	
Modeling Support for National Park Planning: Initial Results from a Case Study of Glacier National Park	1021
<i>Andrew Ford, Thuy Nguyen, Allyson Beall</i>	
Different Kids—How Typical Schools Are Built to Fail and Need to Change: A Structural Analysis	1051
<i>Alan Gaynor</i>	
Time Out Politics: Transforming Time Into Space	1087
<i>Nicholas Georgantzas, Georges D. Contogeorgis</i>	
Choosing the Right Tool for the Job: A Framework to Compare the Effectiveness of Problem Structuring Methods in System Dynamics Modeling	1109
<i>Arash Golnam, Ron Sanchez, Gorica Tapandjieva, Alain Wegmann</i>	
Unintended Effects of Changes in NIH Appropriations: Challenges for Biomedical Research Workforce Development	1132
<i>Mauricio Gomez Diaz, Navid Ghaffarzagadan, Richard Larson</i>	
Systemic Financial Feedbacks - Conceptual Framework and Modeling Implications	1157
<i>Dieter Granlich, Mikhail Oet</i>	
A System Simulation Model for Type 2 Diabetes in the Saskatoon Health Region	1183
<i>Winfried Grassmann, Jin Zhang, Roland Dyck, Nathaniel Osgood</i>	
Quality of System Dynamics Research: Evidence and Recommendations for Model-Based Studies	1197
<i>Stefan Groesser, Roman Tschupp</i>	
Tangible Stock/Flow Experiments -- Addressing Issues of Naturalistic Decision Making	1198
<i>Andreas Groessler, Jürgen Strohhecker</i>	
Integrating System Dynamics in a Strategic Foresight Process for Firms in Production Networks	1219
<i>Hans-Christian Haag, Meike Tilebein</i>	
Fuel Taxes As an Energy Saving Policy – Potential Misperceptions of Dynamic Effects	1237
<i>Stian Hackett</i>	
Planning via System Dynamics Models; Strategy Dynamics of Market Evolution	1251
<i>Andreas Hadjis, George Papageorgiou</i>	
Adaptive Policymaking Under Deep Uncertainty: Optimal Preparedness for the Next Pandemic	1262
<i>Caner Hamarat, Erik Pruyt, Jan Kwakkel</i>	
The Role of System Dynamics Approaches in Aquatic Disease Management: An Application to Sea Lice Control in Norway	1279
<i>Kanar Hamza, Karl Rich, David Wheat</i>	
Dynamic Aging Population in Germany: A Case Study About Demographic Change	1365
<i>Oliver Handel, Aziiz Sutrisno</i>	
Group Model Validation	1404
<i>Roland Maximilian Happach, Guido Veldhuis, Jac Vennix, Etienne Rouwette</i>	

Model Behavior and the Strengths of Causal Loops: Mathematical Insights and a Practical Method	1435
<i>John Hayward</i>	
Modelling Collaboration to Optimise Innovation	1465
<i>Benjamin Heslop</i>	
Climate Change Actions in the Urban Context: A Tool for Decision Makers	1488
<i>Monika Heyder, Alessandra Goetz, Susanne Schmidt, Maria Sipowicz, Pablo Viejo Garcia, Simon Aulagnier</i>	
Communicating Complexity in Indonesia's Electricity Economics and Market Development Using System Dynamics Based Game	1504
<i>Akhmad Hidayatno, Armand Moeis, Nuzul Achjar, Aziz Sutrisno</i>	
Deceased Donor Potential for Organ Transplantation: A System Dynamics Framework	1515
<i>Gary Hirsch, Khalid Saeed, Karl McCleary, Kevin Myer</i>	
ReThink Health Dynamics: Understanding and Influencing Local Health System Change	1544
<i>Gary Hirsch, Jack Homer, Bobby Milstein, John Sterman, Christina Ingersol, Leigh Scherrer, Laura Landy, Elliott Fisher</i>	
System Dynamics and Genetic Artificial Neural Network Models for the Monitoring and Early Warning of Urban Housing Market	1568
<i>Yu-Feng Ho, Hsiao-Lin Wang, Cheng-Chih Liu</i>	
SDA: System Dynamics Simulation of Inter Regional Risk Management Using a Multi-Layered Model with Delays and Anticipation	1598
<i>Stig Holmberg, Daniel Dubois</i>	
Understanding Social Determinants from the Ground Up	1609
<i>Peter Hovmand, Alissa Nelson, Kenneth Carson</i>	
Designing Public Health Dissemination and Delivery Systems	1623
<i>Peter Hovmand, Matthew Kreuter, James Dearing</i>	
Modeling Movie Release Strategies	1635
<i>Christopher Hughes</i>	
Agent-based Modeling of College Drinking Behavior and Mapping of Feedback Mechanism of Alcohol Reduction using both Environmental and Individual-based Intervention Strategies	1636
<i>Edward Ip, Mark Wolfson, Douglas Easterling, Erin Sutfin, Kimberly Wagoner, Jill Blocker, Kathleen Egan, Hazhir Rahmandad, Shyu-Huei Chen</i>	
Competition Between Firms – System Dynamics and Other Approaches	1657
<i>Michael Joffe</i>	
Linking Economic Modeling and System Dynamics: A Basic Model for Monetary Policy and Macroprudential Regulation	1669
<i>Klaus John</i>	
Toward a Dynamic View on Client Dependence in IS Outsourcing Relationships: A Qualitative System Dynamics Approach	1685
<i>Jasmin Kaiser, Peter Buxmann</i>	
"Small Changes Can Cause Big Problems Over Time": Insights from a Systems Thinking Intervention on Ecosystems with 4th Graders	1702
<i>Florian Kapmeier, Jörg Gerigk</i>	
Revisiting the Dynamics of Collapse: Globalization, Economic Growth & Rising Inequalities in the 19th Century Ottoman Empire	1721
<i>Özge Karanfil</i>	
How to Explore and Manage the Future? Formal Model Analysis for Complex Issues under Deep Uncertainty	1722
<i>Bas Keijser, Jan Kwakkel, Erik Pruyt</i>	
Understanding Spatiotemporal Patterns of Hybrid-Electric Vehicle Adoption in the United States	1740
<i>David Keith, John Sterman, Jeroen Struben</i>	
The Wizard of Oz & System Dynamics' Application to System Test	1741
<i>Merrill Kendall</i>	
System Dynamics Models of Information Systems Investment Appraisal	1756
<i>Michael Kennedy</i>	
Application of System Dynamics to Assess Mass Flows of Waste Electrical and Electronic Equipment (WEEE)	1757
<i>Deepali Khetriwal, Rolf Widmer, Markus Schwaninger, Lorenz Hilty</i>	
"Strategy Dynamics of a Social Enterprise in India" – Impacts of System Dynamics on Conventional Strategy Formulation	1758
<i>Karan Khosla</i>	
Model-based Decision Support for Future OEM Power-train Portfolios: Academic Solutions for Practical Requirements	1772
<i>Karsten Kieckhafer, Katharina Wachter, Joachim Axmann, Thomas Spengler</i>	

Designing Perpetual Sustainability Improvement Programs for Built Infrastructures	1791
<i>Amy Kim, Vahid Faghihi, Amir R. Hessami, David Ford</i>	
Institutional Political Dynamics: Political Cycles Between the Liberal and the Conservative	1814
<i>Dong-Hwan Kim, Khalid Saeed</i>	

Volume 3

Using Casual Loop Diagrams & Systems Analysis to Explore Alternative Climate Change Adaptation Strategies in Seyhan River Basin	1833
<i>Deniz Koca, Harald Sverdrup</i>	
Assessing Understanding and Learning About Dynamic Systems	1855
<i>Birgit Kopainsky, Maria Saldarriaga</i>	
Prostitution and Human Trafficking: A Model-based Exploration and Policy Analysis	1882
<i>András Kovari, Erik Pruyt</i>	
Criteria Approach to Verification at Cognitive Mapping of Ill-Structured Situation Dynamics	1906
<i>Svetlana Kovriga, Nina Abramova</i>	
Reducing the Climate Impact of Transport – Technologies and Policies for Road Transport	1929
<i>Michael Krail, Wolfgang Schade</i>	
System-Based Feedback Analysis of E-Mobility Diffusion in China	1946
<i>André Kühn, Simon Glöser</i>	
Transdisciplinary Learning in Rural India: Reflections and Considerations from an Intensive Two-Week Course	1965
<i>Jill Kuhlberg, Peter Hovmand, Gautam Yadama</i>	
A Systems Perspective of Cycling and Bike-sharing Systems in Urban Mobility	1966
<i>Ashwani Kumar, Kwong Meng Teo, Amedeo Odoni</i>	
Modeling Start-ups Using System Dynamics: Towards a Generic Model	1980
<i>Martin Kunc, Xiaojun Huang</i>	
System Dynamics and Innovation: A Complex Problem with Multiple Levels of Analysis	2002
<i>Martin Kunc</i>	
Exploratory System Dynamics: A Directed Search for Limits to Global Water Use	2019
<i>Jan Kwakkel, Jos Timmermans</i>	
A System Dynamics Model-Based Exploratory Analysis of Salt Water Intrusion in Coastal Aquifers	2033
<i>Jan Kwakkel, Jill Slinger</i>	
Collaborative Decision Making in a Simulated Stability Operations Exercise: A Prototype Decision Support Tool	2053
<i>Daniel Lafond, Ashley Beattie, Michel Ducharme, Sébastien Tremblay</i>	
The Cause of Growing Foreign-trained Nurse Concentration and Its Impact	2067
<i>Carmen Lee, James Thompson, Robert Eberlein</i>	
Should Korea's Barn Swallows Be on the Red List of Threatened Species?: Population Dynamics Combined with Ecological Changes	2084
<i>Man-Hyung Lee, Nam Hee Choi, Won-Gyu Ha, Jong-Hoon Yoo</i>	
Germany's Electricity Industry in 2025: Evaluation of Portfolio Concepts	2085
<i>Armin Leopold, Bo Hu, Klaus Arto, Irina Dolgoplova, Stefan Pickl</i>	
Linking Innovation and Service Productivity - An Analysis of Interactive Effects in Knowledge-Intensive Business Services	2100
<i>Christian Lerch, Thomas Schmall, Matthias Gotsch</i>	
Hybrid Models in Developing System Thinking	2114
<i>Ilya Levin, Tzur Levin</i>	
Leveraging Supply Chain Relationships – A System Dynamics Perspective	2124
<i>Anson Li, Tiru Arthanari, Yuhua Zhou</i>	
A Supply Chain Paradox	2125
<i>Anson Li, Kambiz Maani</i>	
Societal Aging in the Netherlands: Exploratory System Dynamics Modeling and Analysis	2155
<i>Thomas Logtens, Erik Pruyt, Govert Gijsbers</i>	
The Dynamics of a Judicial Service Supply Chain: A Case Study	2174
<i>Luis Lopez, Roy Zuniga</i>	
Using System Dynamics for Uncertainty Analysis and Integrated Risk Assessment in Geothermal Energy Development	2193
<i>Thomas Lowry, Sean McKenna, Teklu Hadgu, Elena Kalinina</i>	
The Dynamics of Ambidextrous Decision Making	2202
<i>Johannes Luger, Alexander Zimmermann, Stefan Groesser</i>	

Modeling Aviation Security Processes: Dynamics of the Introduction of New Technology in a Complex Socio-technical System	2203
<i>Ignacio Martinez-Moyano, Stephen Conrad, Andrew Cox, M. Samsa</i>	
An Action-Perception Theory of Trust and Confidence in Government	2204
<i>Ignacio Martinez-Moyano, M. Samsa</i>	
Energy Security Dynamics	2205
<i>Ignacio Martinez-Moyano, Charles Macal, David Sallach</i>	
A System Dynamics Bioeconomic Model for Ecologically Sustainable Economic Development in Coastal Ecosystems	2206
<i>Georgia Mavrommati, Kostas Bithas, Panayiotis Panayiotidis</i>	
How Do “Short Sharp Shocks” Affect the Prison Population? A System Dynamics Study of the London Riot Sentences	2231
<i>Richard McDowall</i>	
Design of the System Dynamics Longitudinal Analysis System: Quantifying the Hidden Trajectories of System Dynamics Models	2250
<i>Xiang Meng, Nathaniel Osgood</i>	
Assessment of Technical Manpower Requirements in Agriculture Sector in India	2267
<i>Balagopal Menon, Biswajit Mahanty, D. Rama Rao</i>	
Participatory Policy Modelling for Operational Policy Stream: Tthe Stakeholders and Public Administration Perspective	2282
<i>Birute Mikulskiene, Birute Pitrenaitė</i>	
Shaping the Future of System Dynamics: Challenges and Opportunities	2296
<i>Peter Milling, Andreas Harbig, Leonard Malczynski, Erik Pruyt, Craig Stephens, Nicole Zimmermann</i>	
System Dynamics Analysis on a Management of Airline-Airport Coexistence with a Load Factor Guarantee	2297
<i>Nobuaki Minato, Risako Morimoto</i>	
Speeding Up Energy Transitions: Gaming Towards Sustainability in The Dutch Built Environment	2315
<i>Iman Mohammed, Erik Pruyt</i>	
Interpreting Unfolding Paths of Privatisation in the Steel Industry	2335
<i>Edoardo Mollona</i>	
Modelling the Nigeria’s Electric Power System to Evaluate its Long-Term Performance	2336
<i>Abiodun Momodu, Timothy Oyedepo Oyebisi, T. O. Obilade</i>	
The Efficiency Trap in Process Improvement and the Critical Role of Learning by Doing	2367
<i>J. Bradley Morrison</i>	
Analysis of Adaptation Processes to Offset the Climate Change Effects on Farming Systems in Kenya	2368
<i>Santiago Movilla Blanco</i>	
Sustainable Development: From Discounting to Simulation	2369
<i>Erling Moxnes</i>	
The Tragedy of Overshoots	2370
<i>Erling Moxnes</i>	
How Can the Diffusion of Energy-Efficient Renovations be Accelerated? Policy Implications from a System Dynamics Modeling Study for Switzerland	2392
<i>Matthias Müller, Silvia Ulli-Ber</i>	
A Parametric Analysis of the Effect of a Material Supply Line Delay in Stock Management	2429
<i>Ahmet Mutallip, Hakan Yasarcan</i>	
Modeling a Policy for Managing Polio Vaccine in Japan: Scenario Planning Based on System Dynamics	2441
<i>Yosuke Nakajima, Toshiyuki Yasui, Yoshiaki Ohkami, Naohiko Kotake</i>	
Stories For Teaching Systems Thinking: Development and Implementation Guide	2458
<i>Morteza Nazari, Masoomeh Khandan</i>	
Modeling Arabian Upraise, a System Dynamics Approach: Egypt Case Study	2475
<i>Morteza Nazari, Ali Mashayekhi</i>	
Taylor Ruling Brazil – A System Dynamics Model for Monetary Policy Feedback	2500
<i>Felix Neugebauer</i>	
Dynamic Analysis of Policy Options for Mexico’s Sheep Sector	2521
<i>Charles Nicholson, David Parsons</i>	
Decent Work: Modelling of Workers' Willingness to Work in Construction	2549
<i>Stephen Ogunlana</i>	
Models that Include Cows: The Significance of Operational Thinking	2550
<i>Camilo Olaya</i>	

Exploring Environmental Management Evolution through Maturity States and Behavior Over Time Graphs	2570
<i>Marta Ormazabal, Eliot Rich, Jose Mari Sarriegi</i>	
15 Things System Dynamics Can Learn from Software Development	2590
<i>Nathaniel Osgood, Yuan Tian</i>	
An Application of System Dynamics in Electricity Supply Systems: Case of Yazd Regional Electricity Company in Iran	2610
<i>Mohammad Owlia, Hossein Dastkhan</i>	
Effects of Delay, Nonlinearity and Feedback on the Overall Complexity of a Stock Management Game	2634
<i>Onur Özgün, Yaman Barlas</i>	
Systemic Complexity of a Growth Management Game: Comparative Analysis of Decision Heuristics and Experimental Results	2664
<i>Onur Özgün, Yaman Barlas</i>	
System Dynamics Modelling for Assessing Promotion Strategies of Biofuels Used in Land Transportation	2695
<i>George Papachristos, Emmanuel Adamides</i>	
Case Study and System Dynamics Research: Complementarities, Pluralism and Evolutionary Theory Development	2720
<i>George Papachristos</i>	

Volume 4

Can We Reverse the Atmospheric CO₂ Concentration Trend Using Cooperation? Model-based Management for Effective Cooperation	2749
<i>Jorge Andrick Parra Valencia, Isaac Dyer</i>	
Ozone Depleted and Depletion of Cooperation: Model-based Management Assessment to Keep Collective Action Running Long Term	2772
<i>Jorge Andrick Parra Valencia, Isaac Dyer</i>	
Estimating the Impact Factor of Undiscovered Design Errors on Construction Quality	2789
<i>Kiavash Parvan, Hazineh Rahmandad, Ali Haghani</i>	
Using Soft Systems Methodology and System Dynamics in Mining Operations in Peru: Initial Findings for a Boundary Critique	2805
<i>Alberto Paucar-Caceres, Diane Hart, Ricardo Rodriguez-Ulloa</i>	
Money Multiplier Dynamics and Banking Liquidity Cycles	2806
<i>David Peterson, Mariano Blanc</i>	
Care & Cure Combined: Using Simulation to Develop Organization Design Theory for Health Care Processes	2835
<i>Angele Pieters, Kim Van Oorschot, Henk Akkermans</i>	
Strategic Control of Agro-Industrial Cooperatives: A Strategic Map Proposal	2866
<i>Roberto Protil, Reginaldo Barreiros</i>	
Economic Evaluation of Agronomic Research In Agricultural Cooperatives: Proposal of a Dynamic Scorecard Model	2890
<i>Roberto Protil, Alfredo Kugeratski Souza</i>	
Making System Dynamics Cool IV: Teaching & Testing with Cases & Quizzes	2907
<i>Erik Pruyt</i>	
Developing Scenarios for Deeply Uncertain Dynamically Complex Risks: Exploring Plausible Futures of Lyme Disease	2930
<i>Erik Pruyt, Jeroen Coumou</i>	
Integrated Risk-Capability Analysis under Deep Uncertainty: An Integrated ESDMA Approach	2951
<i>Erik Pruyt, Jan Kwakkel</i>	
A Bright Future for System Dynamics: From Art to Computational Science and More	2974
<i>Erik Pruyt, Jan Kwakkel</i>	
Conceptualizing Human Centered Development -The Case Pakistan	3003
<i>Muhammad Azeem Qureshi, Pål Davidsen</i>	
The Effect of Individual Characteristics of Decision Making and Judgment on Stock-flow Performance	3050
<i>Stefan Raaijmakers, Hubert Korzilius, Etiënne Rouwette, Jac Vennix</i>	
Modeling the Impacts of Middle East and North Africa Unrest on the Global Oil Price	3061
<i>Mohammad Hussein RafieiSakhaei, Masoud Jabbari</i>	

Reporting Guidelines for Simulation-based Research in Social Sciences	3075
<i>Hazhir Rahmandad, John Sterman</i>	
Modeling the Dynamics of Human Body Growth and Maintenance	3091
<i>Hazhir Rahmandad</i>	
How Can Mitigation and Adaptive Capacities to Climate Change Be Best Enhanced in Spain? A Human Values Evolutionary Approach	3103
<i>Neus Raines</i>	
A System Dynamics Approach to Exploring Sustainable Tourism Development	3131
<i>Weijia Ran</i>	
Fixed and Sliding Goals in Education?	3161
<i>George Richardson</i>	
Dynamics of Value-based Management – – Does Shareholder Value Cause Short-termism?	3200
<i>Robert Rieg</i>	
The Impact of Competitive Interactions on Category Penetration and Purchase Frequency of Mature FMCG Categories	3225
<i>Laurent Rochat, Ann Van Ackere</i>	
System Dynamics Model for Remanufacturing in Closed Loop Supply Chains	3241
<i>Lewlyn Rodrigues, Farahnaz Motlagh, Deepak Ramesh, Vasanth Kamath</i>	
System Dynamics Based Perspective to Reliability Centered Maintenance	3271
<i>Lewlyn Rodrigues, Farahnaz Motlagh, Sunith Hebbar, Vasanth Kamath</i>	
Employing System Thinking for Building Shared Vision in a Youth-led NGO	3288
<i>Eduard Romanenko</i>	
Determination of Effective Policies for Ecological Agriculture Development with System Dynamics – Case Study in Slovenia	3295
<i>Crtomir Rozman, Karmen Pazek, Andrej Skraba, Jernej Turk, Miroljub Kljajic</i>	
Re-designing Policy and Process in Health Care Service Delivery: A System Dynamics Case Study	3307
<i>Tom Rust, Khalid Saeed, Isa Bar-On, Oleg Pavlov</i>	
Insights into Income Policy for Enhancing Employment and Stability of Capital Accumulation	3329
<i>Alexander Ryzhenkov</i>	
The Crises of Water and Population: The Case of Central Iran	3359
<i>Arman Sadreddin, Jamshid Parvizian</i>	
Modelling Ethanol Supply, Demand and Price in the Brazilian Macro Economy	3372
<i>Erico Santos, Pål Davidsen</i>	
Analyse of Tax Competition in Brazil Using the System Dynamic Approach	3404
<i>John Santos, Francisco Cassuce, Roberto Protil, Newton Bueno</i>	
A System Dynamics Approach for Knowledge Management and Business Excellence: An Application in Iran	3430
<i>Mohammad Saryazdi, Mohammad Owlia, Jamal Hosseini Azabadi</i>	
Future Development of 2nd Generation Biofuels in Transport Considering Learning Rates	3442
<i>Burkhard Schade</i>	
Learning to Think in Circles: Improving Mental Models of a Dynamic System	3469
<i>Martin Schaffernicht, Stefan Groesser</i>	
Modeling as Autonomous System: Varela Meets Darwin	3497
<i>Martin Schaffernicht, Camilo Olaya</i>	
Handling Complex Environmental Issues. Group Modeling As a Deliberative Platform at the Science-Policy-Democracy Interface	3525
<i>Peter Schlyter, Ingrid Stjernquist, Harald Sverdrup</i>	
Success Dynamics - A Concept for building System Dynamics Models as Decision Support within Strategic Management	3539
<i>Lukas Schmid, Justus Gallati, Katrin Huegel, Marcel Loher</i>	
The Transition of the Residential Heat Market in Germany - A Dynamic Simulation Approach	3567
<i>Susanne Schmidt, Tobias Jaeger, Ute Karl</i>	
Designing Simulations for Use in Higher Education	3592
<i>William Schoenberg, Michael Bean</i>	
Different Concepts of Dynamics in Strategy Research	3604
<i>Markus Schwenke, Stefan Groesser</i>	
Evaluation of Group Model Building in a Strategy Implementation Context: A New Zealand Government Case Study	3605
<i>Rodney Scott, Robert Cavana, Donald Cameron, Kambiz Maani</i>	
The Dynamics of Undersea Cables: Emerging Opportunities and Pitfalls	3619
<i>Michael Sechrist, Chintan Vaishnav, Daniel Goldsmith, Nazli Choucri</i>	

A Dynamic Model of Two Competing Cities: The Effects of Competition on Tolls and Land Use	3620
<i>Simon Shepherd, Chandra Balijepalli</i>	
Exploring Barriers to Implementing System Dynamics Tools for K-12 Sustainability Education	3634
<i>Heather Skaza, Kent Crippen, Kristoffer Carroll</i>	

Volume 5

Modeling of the Air-Pollution Emergency Situations Control and Geographical Information Processing for Rescue Decision Making	3675
<i>Andrej Skraba, Radovan Stojanovic, Simon Berkowicz, Raffaele De Amicis, Giuseppe Conti, Doron Elhanani, Davorin Kofjac</i>	
European Union Economy System Dynamic Model Development	3687
<i>Valerijs Skribans</i>	
Designing and Analysis a Dynamic Model of World Class Manufacturing in Iranian Automotive Industry	3697
<i>Alireza Soloukdar</i>	
Ex Ante and Ex Post Sustainability of Energy Choices	3725
<i>Marta Somogyvari</i>	
Heating or Transporting	3743
<i>Marta Somogyvari, Tibor Kiss, Viktor Kiss, József Vajda</i>	
Dealing with Public Debt Burden: A System Dynamics Approach to Implement Sustainable Financial Policies in the Italian State	3755
<i>Pietro Sorci</i>	
Interrelations Between Demography and Economy: The Decline of Fertility Rate, an Analysis With System Dynamics	3783
<i>M. Dolores Soto-Torres, Ramon Fernandez-Lechon, Pedro Fernandez Soto</i>	
Road Safety Strategies: An Analysis with System Dynamics	3798
<i>M. Dolores Soto-Torres, Ramon Fernandez-Lechon, Pedro Fernandez Soto</i>	
Policy Resistance to Fuel Efficient Cars and the Adoption of Next-Generation Technologies	3808
<i>Peter Stasinopoulos, Paul Compston, Haley Jones</i>	
What Can Students Learn from Simple Simulations about Accumulations?	3828
<i>Krystyna Stave</i>	
Web-based Simulations for Strategy and Sustainability: The MIT Sloan LearningEdge Management Flight Simulators	3852
<i>John Sterman</i>	
Searching for the Magnificent Mountain Landscape – Environmental Management in the Swedish Mountain Areas	3897
<i>Ingrid Stjernquist, Harald Sverdrup, Peter Schlyter, Salim Belyazid, Deniz Koca, Ulrika Jonsson-Belyazid</i>	
Using System Dynamics Approach to Support Sustainable Growth of Small and Medium Enterprises’ Quantity In Indonesia	3902
<i>Athor Subroto</i>	
Understanding Complexities in Public Policy Making Process Through Policy Cycle Model: A System Dynamics Approach	3924
<i>Athor Subroto</i>	
SD Model of Romeo and Juliet	3954
<i>Toru Suetake</i>	
The World 5 Model: Peak Metals, Minerals, Energy, Wealth, Food and Population; Urgent Policy Considerations for a Sustainable Society	3975
<i>Harald Sverdrup, Deniz Koca, Vala Ragnarsdottir</i>	
Modelling the Gold Market, Explaining the Past and Assessing the Physical and Economical Sustainability of Future Scenarios	4002
<i>Harald Sverdrup, Deniz Koca, Christer Granath</i>	
Modeling the Survival of Athenian Owl Tetradrachms Struck in the Period from 526 BC to 42 AD, from 526 BC to the Present	4024
<i>Harald Sverdrup, Peter Schlyter</i>	
Investigating the Root Causes of Multiple Sclerosis Using Systems Analysis and Dynamics, Developing an Integrated Treatment Strategy	4044
<i>Harald Sverdrup, Vala Ragnarsdottir, Thomas Wood, Ulrik Sverdrup</i>	
Water Cycle Analysis System Dynamics Model for Designing Optimal Water Reclamation Scheduling	4075
<i>Shinsuke Takahashi</i>	

Fallacy of “Decomposition”: Cooperation Rather than Competition Inside Organizations	4087
<i>Yutaka Takahashi, Nobuhide Tanaka</i>	
Control Heuristics for Soft Landing Problem	4098
<i>Togay Tanyolac, Hakan Yasarcan</i>	
Strategic Implications of Workplace Policies on Nursing Capacity Planning	4124
<i>James Thompson, John Ansah, Carmen Lee, Robert Eberlein</i>	
Strategic Planning Model & Tools for a State University College.....	4141
<i>Jeff Trailer</i>	
A System Dynamics Model of Evolving Supply Chain Relationships and Inter-firm Trust	4155
<i>Yatsai Tseng, Weiyang Wang, Mengjue Wang</i>	
Is Ability of Solving Complex Stock-Flow Problems Associated with Ability of Solving Simpler Ones? An Experiment in Turkey	4170
<i>Ufuk Turen, Yunus Gokmen, Hakan Dilek, Yavuz Ercil</i>	
Accounting Dynamics -- Rethinking about Theoretical Framework.....	4184
<i>Akira Uchino, Kinya Machida</i>	
Using System Dynamics to Contribute to Ecological Economics.....	4191
<i>Takuro Uehara, Yoko Nagase, Wayne Wakeland</i>	
Enhancing the Understanding of Corruption through System Dynamics Modelling	4221
<i>Muhammad Ullah, Tiru Arthanari, Anson Li</i>	
Assessing Threats and Opportunities of Induced Technology Change: Long and Short Term Cycles in the Carmaker Industry	4251
<i>Silvia Ulli-Ber, Benjamin Boksberger, Manuel Bouza, Alexander Wokaun</i>	
A Preliminary Model of Innovation Systems.....	4278
<i>Mauricio Uriona Maldonado, Ricardo Pietrobon, Gregorio Varvakis, Elias Cesar De Carvalho</i>	
Power-leveling As an Effect of Group Model Building.....	4294
<i>Bert Van Nistelrooij, Etiënne Rouwette, Ilse Verstijnen, Jac Vennix</i>	
A Problem of a Shortage of Female Managers Or a Problem of a Surplus of Male Managers?.....	4313
<i>Suzanne Van Staveren, Inge Bleijenbergh, Hubert Korzilius, Jac Vennix</i>	
Seeing with the Mind - The Role of Spatial Ability in Inferring Dynamic Behaviour from Graphs and Stock and Flow Diagrams	4334
<i>Guido Veldhuis, Hubert Korzilius</i>	
System Dynamics Modeling of Medical Use, Nonmedical Use and Diversion of Prescription Opioid Analgesics	4357
<i>Wayne Wakeland, Alexandra Nielsen, Teresa Schmidt</i>	
Customer Lifetime Value Promotion Strategy Analysis Based on System Dynamics Model.....	4379
<i>Shoujin Wang, Ying Qian, Yuening Li</i>	
To Grow or Not to Grow? A Multiple-Cases Study on the Growth Dynamics in Medical Care Software Firms.....	4390
<i>Weiyang Wang</i>	
Understanding and Managing the Threat of Disruptive Events to the Critical National Infrastructure.....	4411
<i>Kim Warren, Robert Thurlby</i>	
System Dynamics of the Competition of Municipal Solid Waste to Landfill, Electricity, and Liquid Fuel in California	4433
<i>Jessica Westbrook, Leonard Malczynski, D. K. Manley</i>	
Modeling Fertility in Lithuania: A Preliminary Report.....	4450
<i>David Wheat</i>	
Using System Dynamics to Analyze Innovation Diffusion Processes Within Intra-organizational Networks.....	4451
<i>Philipp Wunderlich, Andreas Groessler</i>	
Dynamics of Strategic Initiatives and Expected Performance: An Application of Flexible Strategy Game-card.....	4475
<i>Neetu Yadav, Sushil Sushil, Mahim Sagar</i>	
On the Monetary and Financial Stability under A Public Money System - Modeling the American Monetary Act Simplified.....	4496
<i>Kaoru Yamaguchi</i>	
Simulating the Impact of Different Control Policy on Private Car in Beijing: A System Dynamics Approach.....	4525
<i>Yang Yang, Hefeng Tong, Xu Zhang</i>	
A Soft Landing Model and an Experimental Platform as an Introductory Control Design Tool.....	4526
<i>Hakan Yasarcan, Togay Tanyolac</i>	
Financial Sustainability of Social Security Institutions in the Presence of Aging Populations	4545
<i>Mustafa Yavas, Gizem Bacaksizlar</i>	

A Novel Way to Measure (Dis)similarity Between Model Behaviors Based on Dynamic Pattern	
Features	4561
<i>Gönelç Yucel</i>	
Industry Analysis: The Fastener Supply Chain in Aerospace Industry	4562
<i>Emad Zilouchian, Arturo Cardenas Martinez, Saeed Koochak-Yazdi, Hani Murad</i>	
Author Index	