CURRICULUM VITAE
SUSHKO IRYNA

Name: SUSHKO Iryna Mykhailivna
Born: 15.01.1967, Kyiv region, Ukraine
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Academic position: Senior Scientific Researcher, Institute of Mathematics, National Academy of Sciences of Ukraine
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Languages: Ukrainian (native), English, Italian, Russian.

Education and Scientific Employment

1984-1989	Cybernetics Faculty, Kyiv State University, Diploma of mathematician (Master's degree)
1989-1992	Postgraduate course, Institute of Mathematics, NASU (supervisors: Prof. A. Sharkovsky and Prof. Yu. Maistrenko)
Feb. 1993	Academic Degree of Candidate of Sciences in Physics and Mathematics (PhD)
1993-2002	Scientific Researcher, Ordinary Differential Equations Dept., Institute of Mathematics, NASU
2002-present	Senior Scientific Researcher, Dept. of Differential Equations and Oscillation Theory, Institute of Mathematics, NASU
Sep. 2004 - Sep. 2005	Research fellow, University of Urbino, Italy (Marie Curie Fellowship within the 6-th European Community Framework Programme)
Nov. 2009 - present	Visiting Professor at the Kyiv School of Economics (Economics Education and Research Consortium, Inc)

Scientific Interests

- Theory of nonlinear dynamical systems (continuous/discontinuous, invertible/noninvertible, smooth/piecewise smooth): regular and chaotic attractors, basins of attraction, bifurcation structure of parameter space;
- Piecewise smooth dynamical systems: border collision bifurcations, normal forms, degenerate bifurcations, dangerous bifurcations;
- Synchronization of periodic, quasiperiodic and chaotic processes;
- Applications in radioengineering (autooscillating systems), economics (business cycle models, growth models, new economic geography models, etc.).

Research Projects, Fellowships, Grants

1. Complex dynamics of two-loops autooscillating systems (1988-1990, in cooperation with Moscow Institute of Radioengineering and Electronics of the USSR Academy of Sciences);
2. Structures emergence in the problems of thermoconductivity and emission (1990-1991, in cooperation with Physics and Engineering Institute of the Uzbek SSR Academy of Sciences);
3. Elaboration of new methods, algorithms and software for nonlinear dynamical systems (1991-1993, grant of the Academy of Sciences of Ukraine);

4. Investigation of mechanisms of bifurcations and chaos in two-dimensional maps (1993-1999, grant of the Academy of Sciences of Ukraine);

5. Cycles and chaotic invariant sets of two-dimensional endomorphisms generated by second order difference equation (1995, grant of the Int. Sci. Foundation);

6. Nonlinear Dynamics and Communications (1996, grant of the Swiss NSF);

7. Complex Dynamics of Duopoly Models (2001, grant of Istituto Nazionale di Alta Matematica Francesco Severi);

8. Bertrand Oligopoly (2001, grant of The Swedish Institute).

9. The fellowship by the Landau Network/Cariplo Foundation (2002, 2003, Universita Cattolica del Sacro Cuore, Milan, Italy).

10. The Marie-Curie International Fellowship within the 6th European Community Framework Programme **FP6** (Sept. 2004 - Sept. 2005, University of Urbino, Italy).

11. Italian Research Project of Relevant National Interest (**PRIN**-2009) "Local interactions and global dynamics in economics and finance: models and tools" (2011-2012).

12. European Cooperation in the field of Scientific and Technical Research (**COST**), Action IS1104: "The EU in the new complex geography of economic systems: models, tools and policy evaluation" (2012-2016).

13. **Co-PI** of the research project on "Models of behavioral economics for sustainable development" (2019-2021), financed by DESP-University of Urbino.

International Conferences and Workshops

1. Inter. School-Conf. on Dynamical Systems (Trieste, Italy, 1991). The title of contribution: "On some family of two-dimensional piecewise linear maps".

2. Czech-Slovak Conf. on Differential Equations and Their Applications EQUADIFF 8 (Bratislava, Slovakia, 1993): "Period adding phenomenon in two-dimensional piecewise linear maps".

3. Int. Workshop on Infinite Dimensional Evolution Processes (Trieste, Italy, 1993): "On some family of two-dimensional piecewise linear maps".

4. Int. School-Conf. "Differential Equations: Bifurcation and Chaos" (Crimea, Ukraine, 1994): "Two-dimensional piecewise linear endomorphisms: period adding phenomenon".

5. Int. Conf. on Nonlinear Dynamics of Electronic Systems - NDES 1994 (Krakow, Poland): "Period adding phenomenon in piecewise linear endomorphisms arising from electronic systems".

6. Int. Conf. "Dynamics Days" (Budapest, Hungary, 1994): "Period adding phenomenon in piecewise linear endomorphisms".

7. Int. Workshop on Dynamical Systems (Moscow, Russia, 1994).

8. Int. Conf. on Nonlinear Dynamics, Chaotic and Complex Systems (Zakopane, Poland, 1995): "Bifurcation phenomena for two-dimensional piecewise linear maps".

9. Int. School-Conf. "Chaos. The Interplay Between Stochastic, Classics and Quanta" (Karpacz, Poland, 1995): "Period adding phenomenon in piecewise linear endomorphisms".

10. European Conf. on Iteration Theory **ECIT** 1996 (Urbino, Italy): "Chaotic attractors at the transition from invertible to noninvertible maps in two-dimen- sional piecewise linear family".

11. Int. Workshop and Seminar "Beyond Quasiperiodicity: Complex Structures and Dynamics" (Dresden, Germany, 1999): "Bifurcation phenomena for two-dimensional piecewise linear maps".

12. Int. Conf. on Discrete Chaotic Dynamics in Nature and Society (Odense, Denmark, 2000): "Influence of quasiperiodic forcing on synchronization processes".

13. Int. Workshop "The Mathematics of Dynamic Economic Models" (Copenhagen, Denmark, 2000): "Two-Dimensional Discrete-Time Dynamical Systems".

14. Int. Workshop on Dynamic Models in Economics and Finance **MDEF** 2000 (Urbino, Italy): "An example of irregular growth cycles model".

15. Int. Conf. "Oligopoly and Complex Dynamics: Methods and Models" (Umea, Sweden, 2001): "Complex Dynamics of the Generalized Palander Duopoly Model".

16. Int. Workshop "Oligopoly Games and Complexity" (Urbino, Italy, 2002): "Duopoly by Palander with discontinuous reaction functions".

17. MDEF 2002 (Urbino, Italy): "Business Cycle: The Hicksian Floor-Roof Model Revisited".

18. Italian Meeting on Game Theory and Application (Urbino, Italy, 2003): "Duopoly with Piecewise Linear Discontinuous Reaction Functions".

19. Int. Conf. on Nonlinear Economic Dynamics **NED** 2004 (Tokyo, Japan): "The Hicksian Floor-Roof Model for two Regions Linked by Interregional Trade".

20. MDEF 2004 (Urbino, Italy): "Bistability and Border-Collision Bifurcations for a Family of Piecewise Smooth Unimodal Maps".

21. Int. Workshop "Bifurcations in Nonsmooth and Hybrid Dynamical Systems" (Milan, Italy, 2004): "Bistability and Border-Collision Bifurcations for a Family of Unimodal Piecewise Smooth Maps".

22. Int. Workshop "Complexity and Randomness in Economic Dynamical Systems", Bielefeld Graduate School of Economics and Management, University of Bielefeld, Germany (Mar. 17-19, 2005): "Center-like Bifurcation for 2Dim Piecewise Linear Maps".

23. Int. Conf. "Keynesian Macrodynamics - the Multiplier-Accelerator Model Revisited", University of Umeå, Sweden (June 10-11, 2005): "Hicksian Business Cycle Model with Smooth and Piecewise Linear Investment Function".

24. Int. Workshop "Functional Analysis Methods in Economics and Finance", University of Calabria, Cosenza, Italy (July 7-9, 2005): "Border-Collision Bifurcation Curves in an Irregular Growth Cycles Model".

25. NED 2005 (Urbino, Italy, July 28-30): "Border-collision bifurcation in Duopoly Model with Capacity Limits".

26. European Marie Curie Conf. "Putting the Knowledge Based Society into Practice" (University of Manchester, UK, April 10-12, 2006): "Dynamical behavior and bifurcations in noninvertible maps of the plane and of the space".

27. ECIT 2006 (Gargnano, Italy, Sept. 10-16): "Center Bifurcation for a Two-Dimensional Piecewise Linear Map".

28. MDEF 2006 (University of Urbino, Italy, Sept. 21-23).

29. ECIT 2008 (Yalta, Ukraine, Sept. 7-13): "On analogue of the center bifurcation at infinity".

30. MDEF 2008 (University of Urbino, Italy, Sept. 25-27): "Regular and Chaotic Growth in a Hicksian Floor/Ceiling Model".

31. NED 2009 (Yonkoping, Sweden, May 31 - June 2): "Center Bifurcation of a point on the Poincaré Equator".

32. Ukrainian Mathematical Congress (Kiev, Ukraine, Aug. 27-29, 2009): "Degenerate Bifurcations and Border Collision in One- and Two-dimensional Piecewise Smooth Maps".

33. Int. Workshop on Nonlinear Maps and their Applications **NOMA** 2009 (Urbino, Italy, Sept. 10-11): "Degenerate bifurcations in one- and two-dimensional piecewise smooth maps".

34. ECIT 2010 (Nant, France, Sept. 12-17): "Center Bifurcation in the Lozi Map".

35. MDEF 2010 (University of Urbino, Italy, Sept. 23-25): "Border Collision Bifurcations in a simple oligopoly model with production constraints".

36. NED 2011 (Cartagena, Spain, June 1-3): "Cycles and Chaotic Attractors in an Infinitely Lived Agent Economy".

37. NOMA 2011 (University of Evora, Portugal, Sept. 15-16): "Border Collision Normal Forms for One- and Two-Dimensional Maps".

38. ECIT 2012 (Ponta Delgada, San Miguel Island, Azores, Portugal, Sept. 9-15): "Bifurcation structure in a piecewise smooth map with two kink points".

39. COST Meeting (University of Urbino, Italy, Sept. 18-19, 2012).

40. MDEF 2012 (University of Urbino, Italy, Sept. 20-22): "Global dynamics of a three-region new economic geography model".

41. SIAM Conference on Applications of Dynamical Systems (Snowbird, Utah, USA, May 19-23, 2013): "Bifurcation Structure in a Piecewise Smooth Map with Two Kink Points".

42. NED 2013 (Siena, Italy, July 4-6): "Dynamics of a New Economic Geography Model in the Presence of an Outside region".

43. MDEF 2014 (University of Urbino, Italy, Sept. 18-20): "Bull and Bear market with different entry thresholds".

44. NED 2015 (Tokyo, Japan, June 25-27): "Dynamics of a two-country New Economic Geography model with four regions".

45. Int. Conference on Open Problem in Nonsmooth Dynamics (Autonomous University of Barcelona, Spain, Feb. 1-5, 2016): "2D Border Collision Normal Form and Smale Horseshoe Construction".

46. Final Conference of COST Action "The EU in the new complex geography of economic systems: Models, tools and policy evaluation" (May 26-27, 2016, Heraklion, Crete, Greece): "The dynamics of a three-region linear NEG model".

47. MDEF 2016 (University of Urbino, Italy, June 23-25): "Globalization and Coupled Chaotic Fluctuations of Innovation".

48. ECIT 2016 (University of Innsbruck, Austria, Sept.4-10): "Codimension-two bifurcations and robust chaos in a 1D piecewise smooth map".

49. Progress on Difference Equations **PODE** 2017 (University of Urbino, May 29-31): "Smale Horseshoe in 2D Noninvertible Maps".

50. International Conference on Difference Equations and Applications **ICDEA** 2017 (University of Timisoara, Romania, July 24-28): "Snap-back repellers and critical homoclinic orbits".

51. NED 2017 (University of Pisa, Italy, Sept.7-9): "Fashion Cycles: a Discrete Time Analysis".

52. 41st Annular Meeting of the Association for Mathematics Applied to Social and Economic Sciences, **AMASES** (University of Cagliari, Italy, Sept. 14-16, 2017): "Globalization and coupled chaotic fluctuations of innovation".

53. ICDEA 2018 (Technical University of Dresden, Germany, May 21-25): "2D discontinuous map: emergence of fashion cycles".

54. International Conference The Economy as a Spatial Complex System - ESCOS 2018 (University of Naples, Italy, June 21-22): "Dynamics of a discrete-time fashion cycle model".

55. MDEF 2018 (University of Urbino, Italy, Sept.6-8): "Dynamics of a generalized fashion cycle model".

56. Int. Workshop on Macroeconomic Dynamics, Multiple Equilibria, Poverty Traps (University of Urbino, Italy, 24 Sept., 2018): "2D discontinuous piecewise linear map: Emergence of fashion cycles".

57. ICDEA 2019 (University College London, UK, June 24-28): "Center bifurcation in the Lozi map".

58. NED 2019 (Kyiv School of Economics, Ukraine, Sept. 4-6): "A piecewise linear model of credit traps and credit cycles: a complete characterization".

59. Workshop "New Developments in Economic Dynamics" (University of Urbino, Italy, Nov. 5, 2019): "The dynamics of a two-class growth model with optimal saving and switch in behavior"; "A piecewise linear model of credit traps and credit cycles: a complete characterization".

60. ICDEA 2021- online (University of Sarajevo, Bosnia and Herzegovina, July 26-30): "The role of border collision bifurcations for emergence of business cycles".

61. NED 2021- online (Catholic University of Milan, Italy, Sept.13-15): "Perception of fundamental values and financial market dynamics: Mathematical insights from a two-dimensional piecewise linear map".

62. ECIT 2022 - online (University of Vienna, Austria, June 13-17): "Bifurcations of closed invariant curves in a 2D piecewise smooth map".

63. ICDEA 2022 (University of Paris-Saclay, France, July 18-22): "Sentiment-driven financial market dynamics: Mathematical insights from a 2D nonsmooth map".

64. MDEF 2022 (University of Urbino, Italy, Sept.8-10): "Sentiment-driven financial market dynamics: Mathematical insights from a 2D nonsmooth map".

65. PODE 2023 (University of Milan, Italy, May 29-31): "Lozi map embedded into the 2D border collision normal form".

Teaching Experience

- Kyiv School of Economics, *Mathematics for Economists* course (term V, 2009-2023); Best Visiting Professor award in 2015 and 2018.

- University of Urbino, PhD Programme in Global Studies: International Economic Policy, Business and Governance, course on *Linear and Nonlinear Dynamics* (Nov. 2021).

Invited lector

1. Int. School on Discrete Dynamical Systems (Urbino, Italy, 2004).

2. Tutorial Workshop "Nonlinear Dynamics in Economic Modelling", University of Trento, CIFREM, Italy (March 12-13, 2009).

3. Tutorial Workshop "Discrete Dynamical Systems and Applications" (Urbino, June 30 - July 3, 2010).

4. Tutorial Workshop "Topics in Nonlinear Dynamics: Nonlinear Dynamics of Piecewise-Smooth Dynamical Systems" (Urbino, Sept. 21-23, 2011).

5. Tutorial Workshop "Topics in Nonlinear Dynamics. Bifurcations in Piecewise-Smooth Systems: Perspectives, Methodologies and Open Problems" (Urbino, Sept. 11-16, 2013).

6. Training School "On Qualitative Theory of Dynamical Systems, Tools and Applications", (Urbino, Sept.17-19, 2015).

7. SICC Tutorial Workshop "Topics in nonlinear dynamics", online, Sept.-Oct., 2020.

8. SICC Tutorial Workshop "Topics in nonlinear dynamics", Smooth and Nonsmooth Maps: Theory, Numerical Methods, and Applications to Economics and Finance, June 1, 2023.

Invited Researcher, Visiting Professor, seminar talks

1. National Inst. of Applied Sciences (Toulouse, France, Dec. 1993).
2. Dept. of Economics, Univ. of Urbino (Italy, Sept. 1994, Mar. 1997, Feb.-Mar. 2001, Mar. 2008, Sept.-Oct. 2009-2015); DESP (Feb.-March, Sept. 2016; March, July, Sept. 2017; Feb., Sept., Nov. 2018; July, Sept., Nov. 2019; Sept.-Nov. 2022).
3. Technical Univ. of Denmark (Lyngby, Dec. 1996, Aug. 1999).
4. Swiss Federal Inst. of Technology (Lausanne, Switzerland, Feb. 1997).
5. Heriot-Watt Univ. of Edinburgh (UK, May 1999).
6. Univ. of Potsdam (Germany, Mar. 1999, Oct. 1999).
7. Univ. of Odense (Denmark, Apr. 2000, Apr.-May 2001, Sept.-Oct. 2001).
8. Isak Newton Inst. for Math. Sci., Cambridge Univ. (UK, Oct. 2002).
9. Univ. of Umea (Sweden, June 2001, June 2003, Mar. 2008).
10. Universita Cattolica del Sacro Cuore (Milan, Italy, Feb.-March, May-June, 2002; Nov.-Dec. 2003; Feb.-March 2004).
11. Univ. of Napoli, Dept. of Math. and Stat. (Italy, Sept. 29, 2004).
12. Univ. of Bristol, Dept. of Engineering Math. (UK, Feb. 14-21, 2005).
13. Univ. of Genova, Dept. of Math. (Italy, Mar. 14, 2005).
14. Univ. of Bologna, Dept. of Math. (Italy, Apr. 14, 2005).
15. Univ. of Piacenza, Dept. of Economics (Italy, May 6, 2005).
16. Univ. of Calabria, Dept. of Admin. Sci. (Rende, Italy 2005, Oct. 2009).
17 Weierstrass Inst. for Applied Analysis and Stochastics (Berlin, Germany, Aug. 23-27, 2005, Dec. 4-22, 2006).
18. Instituto Superior Tecnino, Dept. de Matematica (Lisbon, Nov. 2006).
19. Univ. of Stuttgart, Inst. of Parallel and Distributed Systems (March 15-21, 2010, Oct. 2010, Feb. 2011).
20. Univ. of Agder in Kristiansand (Norway, Sept.27 - Oct.1, 2022).

Member of Society/Association

1. Italian Society for Chaos and Complexity SICC http://www.sicc-it.org/en/.
2. Nonlinear Economic Dynamics Society NEDS (President 2015-2021) https://nedsociety.wordpress.com/.
3. International Society of Difference Equations ISDE http://isdeds.com/home.html.
4. International Association for Mathematics and Computers in Simulation IMACS. https://www.research.cs.rutgers.edu/~imacs/.

Member of Organizing Committee

1. Int. School-Workshop on Dynamical Systems and Turbulence (1991, Crimea, Ukraine).
2. Int. School-Conf. "Differential Equations: Bifurcations and Chaos" (1994, Crimea, Ukraine).
3. European Conf. on Iteration Theory ECIT (Yalta, Crimea, Ukraine, Sep. 7-13, 2008).
4. Int. Conf. on Nonlinear Economic Dynamics NED (Kyiv, Ukraine, Sept. 4-6, 2019).

Member of Scientific Committee

1. Int. Conf. on Nonlinear Economic Dynamics NED (Sweden, 2009, Spain 2011, Ukraine 2019, Italy 2021, Norway 2023).
2. Int. Workshop on Dynamic Models in Economics and Finance MDEF (Italy, 2012, 2014, 2018, 2022).
3. ICDEA (France, 2024).

Member of Editorial Board

1. Associate Editor for the Elsevier journal "Mathematics and Computers in Simulations" (2019 - present).
2. Associate Editor for the Elsevier journal "Communications in Nonlinear Science and Numerical Simulation" (2023 - present).

Member of EU Funding and Tenders Portal, Expert candidature number: EX2021D427644.

Referee for Journals

Physica D, Chaos, Math. and Computers in Simulation, Int. J. of Bifurcations and Chaos, J. of Economic Dynamics and Control, Nonlinear Dynamics, Mathemematical and Computer Modelling, Discrete Dynamics in Nature and Society,

Computational Economics, Applied Mathematical Modelling, Nonlinear Phenomena, Communications in Nonlinear Science and Numerical Simulation, Chaos Solitons & Fractals, Applied Mathematics and Computation, Structural Change and Economic Dynamics, Entropy, Differential Equations and Dynamical Systems, J. of Evolutionary Economics, Qualitative Theory of Dynamical Systems, J. of Difference Equations and Applications, Transactions of Mathematics and Its Applications, J. of Economic Theory.

Author of 119 scientific publications (185 including 59 Abstracts and 7 Editing volums).

List of publications

PhD Thesis, Preprints and Working Papers (**14**)

1. V. L. Maistrenko, Yu. L. Maistrenko, I. M. Sushko. On one noninvertible plane map arising in radiophysics. *Preprint of the Institute of Mathematics of the Academy of Science of Ukraine,* 1992, 33 p.

2. Yu. L. Maistrenko, V. L. Maistrenko, I. M. Sushko. Attractors of piecewise linear maps of straight line and plane. *Preprint of the Institute of Mathematics of the Academy of Sciences of Ukraine,* 1992, 55 p.

3. I. M. Sushko. Thesis "Stability and bifurcations of solutions of the families of difference equations with two deviations of argument". *Institute of Mathematics of the Academy of Sciences of Ukraine,* 1993, 76 p.

4. P. Commendatore, I. Kubin, C. Petraglia and I. Sushko. Economic integration and agglomeration in a customs union in the presence of an outside region. *Vienna University of Economics and Business Administration, Dept. of Economics, Working Paper* No. 146, Oct. 2012.

5. V. Avrutin, I. Sushko, F. Tramontana. Bifurcation structure in a bimodal piecewise linear business cycle model. *DEM Working Paper Series, University of Pavia, 76 (04-14).*

6. I. Sushko, L. Gardini, K. Matsuyama. Chaos in a Model of Credit Cycles with Good and Bad Projects. *Working Papers Series in Economics, Mathematics and Statistics, University of Urbino,* No.2014/05.

7. K. Matsuyama, I. Sushko, L. Gardini. Revisiting the model of credit cycles with good and bad projects. *Geocomplexity: discussion papers series*, February 2015, No. 8/2015.

8. K. Matsuyama, I. Sushko, L. Gardini. Globalization and Synchronization of Innovation Cycles. *Geocomplexity: discussion papers series*, February 2015, No. 9/2015.

9. L. Gardini, R. Makrooni, I. Sushko. Cascades of Alternating Smooth Bifurcations and Border Collision Bifurcations in a Family of Discontinuous Linear-Power Maps. *Geocomplexity: discussion papers series*, February 2016, No. 3/2016.

10. L. Gardini, I. Sushko, K. Matsuyama. 2D discontinuous piecewise linear map: Emergence of fashion cycles. *Working Papers Series in Economics, Mathematics and Statistics, University of Urbino,* No.2017/03.

11. L. Gardini, I. Sushko. Growing through chaos in the Matsuyama map via subcritical flip and bistability. *Working Papers Series in Economics, Mathematics and Statistics, University of Urbino,* No.2018/01.

12. L. Gardini, V. Manosa, I. Sushko. A route to chaos in the Boros-Moll map, arXiv:1804.06587v1 [nlin.CD] 18 Apr 2018.

13. K. Matsuyama, I. Sushko, L. Gardini. A Piecewise Linear Model of Credit Traps and Credit Cycles: A Complete Characterization. *Working Papers Series in Economics, Mathematics and Statistics, University of Urbino,* No. 2018/06.

14. Gardini L, Schmitt N, Sushko I, Tramontana F, Westerhoff F (2020). Necessary and sufficient conditions for the roots of a cubic polynomial and bifurcations of codimension-1, -2, -3 for 3D maps. WP-EMS # 2019/08, Working Paper Series in Economics, Mathematics and Statistics, https://econpapers.repec.org/paper/urbwpaper/.

Articles (**76**)

15. V. L. Maistrenko, Yu. L. Maistrenko, I. M. Sushko. Noninvertible two-dimensional maps arising in radiophysics. *Int. J. Bifurcation and Chaos, Vol. 4, No. 2 (1994) 383-400*, DOI: 10.1142/S0218127494000253.

16. Yu. L. Maistrenko, V. L. Maistrenko, I. M. Sushko. Bifurcation phenomena in generators with delay lines. *J. Radioengineering and electronics, Moscow*, No. 8-9, 1994, 1367-1380.

17. Ch. Mira, Ch. Rauzy, Yu. L. Maistrenko, I. M. Sushko. Some properties of a two-dimensional piecewise-linear non-invertible map, *Int. J. Bifurcation and Chaos,* Vol. 6, No. 12A (1996), 2299-2319, DOI: 10.1142/S021812749600148X.

18. Yu. L. Maistrenko and I. M. Sushko. Bifurcation phenomena for two-dimensional piecewise linear maps, *J. Tech. Phys.*, Vol. 37, No. 3-4 (1996), 371-378.

19. Yu. Maistrenko, I. Sushko and L. Gardini. About Two Mechanisms of Reunion of Chaotic Attractors, *Chaos, Solitons & Fractals*, Vol.9, No.8, (1998), 1373-1390, DOI: 10.1016/s0960-0779(98)00070-8.

20. E. Neumann, I. Sushko, Yu. Maistrenko, U. Feudel. Synchronization and desynchronization under the influence of quasiperiodic forcing. *Physical Review E 67*, 026202, 2003, DOI: 10.1103/PhysRevE.67.026202. **Q1**.

21. G. Kristensen, S. Yanchuk, I. Sushko. Dynamical Approach to Complex Regional Economic Growth based on Keynesian Model for China. *Chaos, Solitons & Fractals, Vol.18, No.5 (2003), 937-952*, DOI: 10.1016/S0960-0779(03)00064-X. **Q3**.

22. I. Sushko, T. Puu and L. Gardini. The Hicksian Floor-Roof Model for two Regions Linked by Interregional Trade. *Chaos, Solitons & Fractals*, *Vol.18, No.3 (2003), 593-612*, DOI: :10.1016/S0960-0779(02)00679-3. **Q3**.

23. M. Gallegati, L. Gardini, T. Puu and I. Sushko. Hicks' Trade Cycle Revisited: Cycles and Bifurcations, *Mathematics and Computers in Simulation, 63 (*2003). 505-527, DOI: 10.1016/S0378-4754(03)00060-0. **Q3-Q4**.

24. T. Puu, I. Sushko. A Business Cycle Model with Cubic Nonlinearity, *Chaos, Solitons & Fractals, Vol. 19, (2004),* 597-612, DOI: 10.1016/S0960-0779(03)00132-2. **Q2**.

25. I. Sushko, L. Gardini, T. Puu. Tongues of Periodicity in a Family of Two-dimensional Discontinuous Maps of Real Möbius Type, *Chaos, Solitons & Fractals 21 (2004),* 403-412. **Q2**.

26. G. Kristensen, I. Sushko. Complex Market Dynamics under Box-Cox Monopoly, *Chaos, Solitons & Fractals 21 (2004), 591-602.* **Q2**.

27. T. Puu, L. Gardini, I. Sushko. A Hicksian Multiplier-Accelerator Model with Floor Determined by Capital Stock, *Journal of Economic Behaviour and Organization, Vol. 56 (2005)*, 331-348, DOI: 10.1016/j.jebo.2003.10.008. **Q1**.

28. I. Sushko, A. Agliari, L. Gardini. Bistability and Border-Collision Bifurcations for a Family of Unimodal Piecewise Smooth Maps. *Discrete and Continuous Dynamical Systems, Series B (2005), Vol. 5, N 3,* 881-897, DOI: 10.3934/dcdsb.2005.5.881. **Q1-Q2**.

29. G.-I. Bischi, I. Sushko. Foreword "Dynamic Modelling in Economics and Finance" in honour of Professor Carl Chiarella, *Chaos, Solitons & Fractals, Vol. 29, Issue 3 (2006),* 515-516. **Q2**.

30. T. Puu, L. Gardini, I. Sushko. On the Change of Periodicities in the Hicksian Multiplier-Accelerator Model with a Consumption Floor. *Dynamic Modelling in Economics and Finance in honour of Professor Carl Chiarella* (G.I. Bischi and I. Sushko Ed.s), *Chaos, Solitons & Fractals, Vol. 29, Issue 3 (2006),* 681-696. **Q2**.

31. I. Sushko, A. Agliari, L. Gardini. Bifurcation Structure of Parameter Plane for a Family of Unimodal Piecewise Smooth Maps: Border-Collision Bifurcation Curves. *Dynamic Modelling in Economics and Finance in honour of Professor Carl Chiarella* (G.I. Bischi and I. Sushko Ed.s), *Chaos, Solitons & Fractals, Vol. 29, Issue 3 (2006),* 756-770, DOI: 10.1016/j.chaos.2005.08.107. **Q2**.

32. I. Sushko, L. Gardini. Center Bifurcation for Two-Dimensional Border-Collision Normal Form, *Int. J. Bifurcation and Chaos, Vol. 18, Issue 4* (2008), 1029-1050, DOI: 10.1142/S0218127408020823. **Q1-Q2**.

33. L. Gardini, I. Sushko, A. Naimzada. Growing Through Chaotic Intervals. *Journal of Economic Theory 143* (2008), 541-557, DOI: 10.1016/j.jet.2008.03.005. **Q1**.

34. I. Sushko, M. Wegener, F. Westerhoff, G. Zaklan. Endogenous business cycle dynamics within the inventory model of Metzler: Adding an inventory floor. *Nonlinear Dynamics, Psychology and Life Sciences, Vol. 13, No. 2* (2009), 225-235. **Q4**.

35. I. Sushko, L. Gardini, T. Puu. Regular and Chaotic Growth in a Hicksian Floor/Ceiling Model. *Journal of Economic Behaviour and Organization*, 75 (2010), 77-94, DOI: 10.1016/j.jebo.2010.01.007. **Q1**.

36. S. Brianzoni, E. Michetti, I. Sushko. Border Collision Bifurcations of Superstable Cycles in a One-Dimensional Piecewise Smooth Map. *Mathematics and Computers in Simulation,* Vol. 81, Issue 1 (2010), 52-61, DOI: 10.1016/j.matcom.2010.06.018. **Q1-Q2**.

37. I. Sushko, L. Gardini. Degenerate Bifurcations and Border Collisions in Piecewise Smooth 1D and 2D Maps. *Int. J. Bifurcation and Chaos,* Vol. 20, No. 7 (2010), 2045-2070, DOI: 10.1142/S0218127410026927. **Q1-Q2**.

38. L. Gardini, F. Tramontana, I. Sushko. Border Collision Bifurcations in one-dimensional linear-hyperbolic maps, *Mathematics and Computers in Simulation,* Vol. 81, Issue 4 (2010), 899–914. **Q1-Q2**.

39. L. Gardini, I. Sushko, V. Avrutin, M. Schanz. Critical homoclinic orbits lead to snap-back repellers. *Chaos, Solitons & Fractals,* 44 (2011) 433–449, DOI: 10.1016/j.chaos.2011.03.004. **Q1**

40. G.-I. Bischi, F. Lamantia, I. Sushko. Border Collision Bifurcations in a simple oligopoly model with production constraints. *Int. J. Appl. Math. and Statistics*, Vol. 26, No. 2 (2012), 121-135. **Q4**.

41. A. Panchuk, I. Sushko, B. Schenke, V. Avrutin. Bifurcation Structure in Bimodal Piecewise Linear Map. *Int. J. Bifurcation and Chaos,* Vol. 23, No. 12 (2013), DOI: 10.1142/S0218127413300401. **Q1-Q2**.

42. V. Avrutin, I. Sushko, L. Gardini. Cyclicity of chaotic attractors in one-dimensional discontinuous maps. *Mathematics and Computers in Simulation,* 95 (2014) 126–136, DOI: 10.1016/j.matcom.2012.07.019. **Q1-Q3**.

43. P. Commendatore, A. Pinto, I. Sushko. A post-Keynesian model of growth with a financial constraint on investment. *Structural Change and Economic Dynamics,* Vol. 28 (2014) 12-24, DOI: 10.1016/j.strueco.2013.09.001. **Q2**.

44. I. Sushko, L. Gardini, K. Matsuyama. Superstable Credit Cycles and U-sequence. *Chaos, Solitons & Fractals,* Vol. 59 (2014) 13–27, DOI: 10.1016/j.chaos.2013.11.006. **Q2**.

45. L. Gardini, V. Avrutin, I. Sushko. Codimension-2 border collision bifurcations in one-dimensional discontinuous piecewise smooth maps. *Int. J. Bifurcation and Chaos,* Vol. 24, No. 2 (2014) 1450024 (30 pages), DOI: 10.1142/S0218127414500242. **Q1-Q3**.

46. C. Petraglia, P. Commendatore, I. Kubin, I. Sushko. Regional integration, international liberalisation and the dynamics of industrial agglomeration. *Journal of Economic Dynamics and Control* 48 (2014) 265–287, DOI: 10.1016/j.jedc.2014.07.011. **Q1**.

47. V. Avrutin, L. Gardini, M. Schanz, I. Sushko. Bifurcations of Chaotic Attractors in One-Dimensional Maps, *Int. J. Bifurcation and Chaos.* Vol. 24, No. 8 (2014) 1440012 (10 pages), DOI: 10.1142/S0218127414400124. **Q1-Q3**.

48. V. Avrutin, I. Sushko, F. Tramontana. Bifurcation structure in a bimodal piecewise linear business cycle model. *Abstract and Applied Analysis,* Volume 2014, Article ID 401319, 12 pages, DOI: 10.1155/2014/401319. **Q3**.

49. P. Commendatore, I. Kubin, I. Sushko. Typical Bifurcation Scenario in a Three Region Symmetric New Economic Geography Model. *Mathematics and Computers in Simulation*, 108 (2015) 63–80, DOI: 10.1016/ j.matcom.2014.01.004. **Q1-Q2**.

50. F. Tramontana, I. Sushko, V. Avrutin. Period adding structure in a 2D discontinuous model of economic growth. *Applied Mathematics and Computation,* 253 (2015) 262–273, DOI: 10.1016/j.amc.2014.12.078. **Q2**.

51. A. Panchuk, I. Sushko, V. Avrutin. Bifurcation structures in a bimodal piecewise linear map: chaotic dynamics. *Int. J. Bifurcation and Chaos*, (2015), DOI: 10.1142/S0218127415300062. **Q1-Q2**.

52. I. Sushko, F. Tramontana, F. Westerhoff, V. Avrutin. Symmetry breaking in a bull and bear financial market model. *Chaos, Solitons & Fractals 79* (2015) 57-72, DOI: 10.1016/j.chaos.2015.03.013. **Q2**.

53. P. Commendatore, I. Kubin, P. Mossay, I. Sushko. Dynamic agglomeration patterns in a two-country NEG model with four regions. *Chaos, Solitons & Fractals,* 79 (2015) 2-17, DOI: 10.1016/j.chaos.2015.03.009. **Q2**.

54. R. Makrooni, L. Gardini, I. Sushko. Bifurcation structures in a family of 1D discontinuous linear-hyperbolic invertible maps. *Int. J. Bifurcation and Chaos,* Vol. 25, No. 13 (2015) 1530039 (21 pages), DOI: 10.1142/S0218127415300396. **Q1-Q2**.

55. I. Sushko, V. Avrutin, L. Gardini. Bifurcation structure in the skew tent map and its application as a border collision normal form. *Journal of Difference Equations and Applications,* 22(8) (2015), 1040-1087, DOI: 10.1080/10236198.2015.1113273. **Q2**.

56. K. Matsuyama, I. Sushko, L. Gardini. Revisiting the Model of Credit Cycles with Good and Bad Projects. *Journal of Economic Theory* 163 (2016) 525–556, DOI: 10.1016/j.jet.2016.02.010. **Q1**.

57. I. Sushko, L. Gardini, K. Matsuyama. Robust chaos in a credit cycle model defined by a one-dimensional piecewise smooth map. *Chaos, Solitons & Fractals,* 91 (2016) 299–309; DOI: 10.1016/j.chaos.2016.06.015. **Q2**.

58. I. Sushko, L. Gardini, V. Avrutin. Nonsmooth One-dimensional Maps: Some Basic Concepts and Definitions. *Journal of Difference Equations and Applications,* 22(12) (2016), 1816-1870, DOI: 10.1080/10236198.2016.1248426. **Q2**.

59. V. Avrutin, Zh. Zhusubaliyev, A. Saha, S. Banerjee, I. Sushko and L. Gardini. Dangerous bifurcations revisited. *Int J Bifurcation and Chaos,* Vol. 26, No. 14 (2016) 1630040 (24 pages). **Q1-Q2**.

60. A. Panchuk, I. Sushko, V. Avrutin. Bifurcation structures in a bimodal piecewise linear map. *Frontiers in Applied Mathematics and Statistics* May 2017, Vol 3, Article 7, DOI: 10.3389/fams.2017.00007.

61. E. Ekaterinchuk, J. Jungeilges, T. Ryazanova, I.Sushko. Dynamics of a minimal consumer network with unidirectional influence. *J Evol Econ* (2017) Vol. 27, Issue 5, 831-857, DOI: 10.1007/s00191-017-0517-5. **Q2**.

62. P. Commendatore, I. Kubin, P. Mossay, I. Sushko. The role of centrality and market size in a 4-region asymmetric new economic geography model. *J Evol Econ* (2017) Vol. 27, Issue 5, 1095-1131, DOI: 10.1007/s00191-017-0540-6. **Q2**.

63. E. Ekaterinchuk, J. Jungeilges, T. Ryazanova, I.Sushko. Dynamics of a minimal consumer network with bidirectional influence. *Commun Nonlinear Sci Numer Simulat,* 58 (2018), DOI: 10.1016 /j.cnsns.2017.04.007, 107-118. **Q1**.

64. P. Commendatore, I. Kubin, I. Sushko. Dynamics of a developing economy with a remote region: Agglomeration, trade integration and trade patterns. *Commun Nonlinear Sci Numer Simulat* 58 (2018), 303-327, DOI: 10.1016/j.cnsns.2017.04.006. **Q1**.

65. I. Sushko, L. Gardini, K. Matsuyama. Coupled chaotic fluctuations in a model of international trade and innovation: Some preliminary results. *Commun Nonlinear Sci Numer Simulat,* 58 (2018), 287-302; DOI: 10.1016/j.cnsns.2017.06.020. **Q1**.

66. L. Gardini, R. Makrooni, I. Sushko. Cascades of alternating smooth bifurcations and border collision bifurcations with singularity in a family of discontinuous linear-power maps. *Discrete and Continuous Dynamical Systems, Series B* Vol.23(2) (2018), 701-729; DOI: 10.3934/dcdsb.2018039. **Q2-Q3**.

67. L. Gardini, I. Sushko, K. Matsuyama. 2D discontinuous piecewise linear map: Emergence of fashion cycles, *CHAOS* 28, 055917 (2018); DOI: 10.1063/1.5018588. **Q1**.

68. A. Panchuk, I. Sushko, F. Westerhoff. A market model with two discontinuities: bifurcation structures in chaotic domain, *CHAOS* 28, 05 (2018); DOI: 10.1063/1.5024382. **Q1**.

69. K. Matsuyama, I. Sushko, L. Gardini. A piecewise linear model of credit traps and credit cycles: a complete characterization, *Decisions in Economics and Finance* Vol. 41, Issue 2 (2018), 119–143; DOI: 10.1007/s10203-018-0220-5. **Q3**.

70. L. Gardini, V. Manosa, I. Sushko. A route to chaos in the Boros-Moll map, *Int J Bifurcation and Chaos* 29(04):1930009 (2019); DOI: 10.1142/S021812741930009X. **Q1-Q2**.

71. L. Gardini, I. Sushko. Growing through chaos in the Matsuyama map via subcritical flip and bistability. *Chaos, Solitons & Fractals.*124 (2019), 52-67; DOI: 10.1016/j.chaos.2019.04.036. **Q1**.

72. I. Sushko, L. Gardini, K. Matsuyama. Dynamics of a generalized fashion cycle model, *Chaos, Solitons & Fractals* 126 (2019), 135-147; DOI: 10.1016/j.chaos.2019.06.006. **Q1**.

73. P. Commendatore, I. Kubin, I. Sushko. A propos Brexit: On the breaking up of integration areas – a NEG analysis, *Spatial Economic Analysis* (2021), 16(1), 97–120; DOI: 10.1080/17421772.2019.1701702. **Q1-Q2**.

74. I. Sushko, P. Commendatore, I. Kubin. Codimension-two border collision bifurcation in a two-class growth model with optimal saving and switch in behavior, *Nonlinear Dynamics* (2020); DOI: 10.1007/s11071-020-05782-5. **Q1**.

75. P. Commendatore, I. Kubin, I. Sushko. Obtaining a hub position: A New Economic Geography analysis of industry location and trade network structures, *Metroeconomica* 2021, 72, 148-172, DOI: 10.1111/meca.12314. **Q2**.

76. L. Gardini, I. Sushko, F. Tramontana. Dynamics of a two-dimensional map on nested circles and rings, *Chaos, Solitons & Fractals* 143 (2021), DOI: 10.1016/j.chaos.2020.110553. **Q1**

77. M. Gallegati, L. Gardini, I. Sushko. Dynamics of a business cycle model with two types of governmental expenditures: the role of border collision bifurcations. *Decisions in Economics and Finance* 27 (2021), 557-578; DOI: 10.1007/s10203-021-00333-y. **Q2**

78. L. Gardini, N. Schmitt, I. Sushko, F. Tramontana, F. Westerhoff. Necessary and sufficient conditions for the roots of a cubic polynomial and bifurcations of codimension-1, -2, -3 for 3D maps, *Journal of Difference Equations and Applications* (2021), 27 (4), 557-578; DOI: 10.1080/10236198.2021.1920937. **Q3**

79. V. Avrutin, A. Panchuk, I. Sushko. Border collision bifurcations of chaotic attractors in 1D maps with multiple discontinuities. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences* (2021), Vol. 477, Issue 2253; DOI: 10.1098/rspa.2021.0432. **Q1**

80. L. Gardini, I. Sushko. Preface: Special Issue on Nonlinear Dynamical Systems in Economic Modelling. *Discrete and Continuous Dynamical Systems, Series B*, Vol. 26, No. 11 (2021), i-iv, DOI: 10.3934/dcdsb.2021241. **Q2**

81. I. Sushko, V. Avrutin, L. Gardini. Center bifurcation in the Lozi map, *Int. J. Bifurcation and Chaos* Vol. 31, No. 16, 2130046 (2021), DOI:10.1142/S0218127421300469. **Q1-Q2**

82. Zh. T. Zhusubaliyev, V. Avrutin, I. Sushko, L. Gardini. Border Collision Bifurcation of a Resonant Closed Invariant Curve, *CHAOS* 32(4), 043101 (2022) DOI: https://doi.org/10.1063/5.0086419. **Q1-Q2**

83. P. Commendatore, I. Kubin, I. Sushko. Big or small? A new economic geography model with an endogenous switch in the market structure. *Chaos, Solitons & Fractals,* Volume 161, 112257 (2022) DOI: 10.1016/j.chaos.2022.112257. **Q1**

84. L. Gardini, D. Radi, N. Schmitt, I. Sushko, F. Westerhoff. Causes of fragile stock market stability. *J of Economic Behavior and Organization,* 200, 483-498 (2022) DOI: 10.1016/j.jebo.2022.06.009. **Q1**

85. J. S. Canovas, L. Gardini, F. Tramontana, A. Panchuk, I. Sushko. Preface to the special issue nonlinear economic dynamics: A tribute to Tönu Puu. *Chaos, Solitons & Fractals,* Volume 162, 112404 (2022) DOI: 10.1016/j.chaos.2022.112404. **Q1**

86. L. Gardini, D. Radi, N. Schmitt, I. Sushko, F. Westerhoff. Perception of fundamental values and financial market dynamics: Mathematical insights from a 2D piecewise linear map. *SIAM Journal on Applied Dynamical Systems,* Vol. 21, Issue 4, 2314-2337 (2022) DOI:10.1137/21m1456339. **Q1**

87. L. Gardini, D. Radi, N. Schmitt, I. Sushko, F. Westerhoff. Currency manipulation and currency wars: Analyzing the dynamics of competitive central bank interventions. *J of Economic Dynamics and Control,* 145,104545 (2022) DOI: 10.1016/j.jedc.2022.104545. **Q1**

88. A. Panchuk, I. Sushko, E. Michetti, R. Coppier. Revealing bifurcation mechanisms in a 2D nonsmooth map by means of the first return map. *Commun Nonlinear Sci Numer Simulat,* Volume 117, 106946 (2023) DOI: 10.1016/j.cnsns.2022.106946.

89. L. Gardini, D. Radi, N. Schmitt, I. Sushko, F. Westerhoff. Sentiment-driven business cycle dynamics: An elementary macroeconomic model with animal spirits. *J of Economic Behavior and Organization* 210, 342-359 (2023) DOI: 10.1016/j.jebo.2023.04.0120.

90. I. Sushko, V. Avrutin, L. Gardini. Lozi map embedded into the 2D border collision normal form, *J of Difference Equations and Applications* (2023) DOI: 10.1080/ 10236198. 2023.2205960.

(submitted)

91. P. Commendatore, I. Kubin, M. Sodini, I. Sushko. The impact of pollution on the dynamics of industry location and residence choice. *Annals of Operations Research* (2023).

92. L. Gardini, I. Sushko, W. Tikjha. Dynamics of a rational map: unbounded cycles, unbounded chaotic intervals and organizing centers. *J of Difference Equations and Applications* (2023).

93. V. Avrutin, A. Panchuk, I. Sushko. Can a border collision bifurcation of a chaotic attractor lead to its expansion?.*Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences* (2023).

94. L. Gardini, D. Radi, N. Schmitt, I. Sushko, F. Westerhoff. A 2D piecewise-linear discontinuous map arising in stock market modeling: two overlapping period-adding bifurcation structures. *SIAM Journal on Applied Dynamical Systems* (2023).

(in progress)

95. K. Matsuyama, I. Sushko, L. Gardini. Globalization and Synchronization of Innovation Cycles.

Proceedings (**12**)

96. Yu. L. Maistrenko, V. L. Maistrenko, I. M. Sushko. Period adding phenomenon in piecewise linear endomorphisms arising from electronic systems. *Proc. of the Workshop NDES-94, Krakow, Poland, 1994,* 39-44.

97. Yu. Maistrenko, I. Sushko. Bifurcation phenomena in autooscillation systems with delay leading to two-dimensional piecewise linear maps. *Proc. of NDES-95,* Dublin, 1995.

98. I. Sushko, Yu. Maistrenko, L. Gardini. On chaotic attractors at the transition from homeomorphism to endomorphism in a family of two-dimensional maps. Proc. of ECIT 1996, *Grazer Math. Ber.*, Nr. 339 (1999), 335-346.

99. I. Sushko, L. Gardini. Degenerate bifurcations in one- and two-dimensional piecewise smooth maps. *Proc. of NOMA* 2009, 1-4.

100. L. Gardini, I. Sushko. Center Bifurcation of a point on the Poincaré Equator. Proc. of ECIT 2008, *Grazer Math. Ber. No. 354* (2009), 254-279.

101. I. Sushko, L. Gardini. Border Collision Normal Forms for One- and Two-Dimensional Maps. *Proc. of NOMA* 2011, 1-4.

102. V. Avrutin, I. Sushko, L. Gardini. On cyclic and acyclic chaotic attractors. *Proc. of NOMA* 2011, 1-4.

103. L. Gardini, I. Sushko, V. Avrutin, M. Schanz. Critical homoclinic orbits lead to snap-back repellers. *Proc. of NOMA* 2011, 1-4.

104. L. Gardini, I. Sushko. Doubling bifurcation of a closed invariant curve in 3D maps. Proc. of ECIT 2010, *European Series in Applied and Industrial Mathematics (ESAIM) Proc.*, April 2012, Vol. 36 (D. Fournier-Prunaret, L. Gardini and L. Reich Ed.s), 175-182.

105. L. Gardini, V. Avrutin, A. Granados, M. Schanz, I. Sushko. Organizing Centers in Parameter Space of Discontinuous 1D Maps. The Case of increasing/decreasing branches. Proc. of ECIT 2010, *European Series in Applied and Industrial Mathematics (ESAIM),* April 2012, Vol. 36 (D. Fournier-Prunaret, L. Gardini and L. Reich Ed.s), 103-117.

106. L. Gardini, R. Makrooni, I. Sushko. Alternating Smooth and Nonsmooth Bifurcations in a Discontinuous Linear-Power Map. *Research Perspectives CRM Barcelona*, Spring 2016, vol. 8, in *Trends in Mathematics*, Springer-Birkhuser, Basel, 59-64.h

107. V. Avrutin, L. Gardini, I. Sushko, Zh. T. Zhusubaliyev, U. A. Sopuev. Border Collision and Heteroclinic Bifurcations in a 2D Piecewise Smooth Map.In: Advances in Discrete Dynamical Systems, Difference Equations and Applications, ICDEA21, Sarajevo, Bosnia and Herzegovina (S. Elaydi, M. R. S. Kulenović, S. Kalabušić Ed.s), *Springer Proc. in Mathematics and Statistics*, Vol. 416, 2023. DOI:10.1007/978-3-031-25225-9.

In books (**15**)

108. Yu. L. Maistrenko, V. L. Maistrenko, I. M. Sushko. Order for the appearance of attractors in piecewise linear systems. *In: Chaos and Nonlinear Mechanics, Series B,* vol. 7, World Scientific, 1994.

109. T. Puu, L. Gardini, I. Sushko. Cournot Duopoly with Kinked Linear Demand According to Palander and Wald. In: *Oligopoly and Complex Dynamics: Models and Tools,* T. Puu and I. Sushko (Ed.s), Springer, 2002.

110. I. Sushko, L. Gardini, T. Puu. Duopoly with Piecewise Linear Discontinuous Reaction Functions. In: *Oligopoly and Complex Dynamics: Models and Tools,* T. Puu and I. Sushko (Ed.s), Springer, 2002.

111. I. Sushko, L. Gardini. Center Bifurcation for a Two-Dimensional Piecewise Linear Map. In: *Business Cycles Dynamics. Models and Tools* (T. Puu and I.Sushko Ed.s), Springer, 2006.

112. L. Gardini, T. Puu, I. Sushko. The Hicksian Model with Investment Floor and Income Ceiling. In: *Business Cycles Dynamics. Models and Tools* (T. Puu and I.Sushko Ed.s), Springer, 2006.

113. L. Gardini, T. Puu, I. Sushko. A Goodwin-type Model with a Piecewise Linear Investment Function. In: *Business Cycles Dynamics. Models and Tools* (T. Puu and I.Sushko Ed.s), Springer, 2006.

114. I. Sushko, T. Puu, L. Gardini. A Goodwin-type Model with Cubic Investment Function. In: *Business Cycles Dynamics. Models and Tools* (T. Puu and I.Sushko Ed.s), Springer, 2006.

115. V. Avrutin, I. Sushko. A gallery of bifurcation scenarios in piecewise smooth 1D maps. In: *Global analysis of dynamic models for economics, finance and social sciences* (G.-I. Bischi, C. Chiarella and I. Sushko Eds.), Springer, 2013.

116. A. Agliari, L. Gardini, I. Sushko. Bifurcation structure in a model of monetary dynamics with two kink points. In: *Festschrift for Carl Chiarella's 70th birthday*, R. Dieci, T. He, C. Hommes (Eds.), Springer 2014.

117. P. Commendatore, I. Kubin, I. Sushko. Trade agreements in a linear FE model. In: *Dynamic Approaches to Global Economic Challenges,* B. Bednar-Friedl, J. Kleinert (Eds.), Springer International Publishing Switzerland 2016 , DOI 10.1007/978-3-319-23324-6_3.

118. I. Kubin, P. Commendatore, I. Sushko. Some dynamical models in regional economics: Economic structure and analytic tools. In: *Qualitative Theory of Dynamical Systems, Tools and Applications for Economic Modelling*, G.I. Bischi, A. Panchuk, D. Radi (Ed.s), Springer Proceedings in Complexity, Springer, 2016, 211-254.

119. G.-I. Bischi, L. Gardini, I. Sushko. Periodicity induced by production constraints in Cournot duopoly models with unimodal reaction curves. In: *Essays in Honour of Ferenc Szidarovszky,* Springer, 2017, 73-93.

120. P. Commendatore, I. Kubin, I. Sushko. Emerging trade patterns in a 3-region linear NEG model: three examples. In: P. Commendatore *et al.* (eds.), *The Economy as a Complex Spatial System*, Springer Proc. in Complexity, DOI 10.1007/978-3-319-65627-4 3, 2018, 38-80.

121. L. Gardini, I. Sushko. Bifurcations in smooth and piecewise smooth noninvertible maps. In: S. Elaydi, C. Pötzsche, A. Luminita Sasu (eds.), *Recent Progress in Difference Equations*, *Discrete Dynamical Systems and Applications.* Springer Proc. in Mathematics and Statistics, 2019.

122. P. Commendatore, I. Kubin, I. Sushko. Behavioral changes and distribution effects in a two-class overlapping generations neoclassical growth model. In: *Festschrift for Carlo Panico*, J. Eatwell, N. Salvadori, P. Commendatore (Eds.), 2022, 167-193.

Books (**1**)

123. V. Avrutin, L.Gardini, I. Sushko, F.Tramontana. Continuous and Discontinuous Piecewise-Smooth One-Dimensional Maps: Invariant Sets and Bifurcation structures. World Scientific Series on Nonlinear Science Series A: Volume 95, World Scientific, 2019, DOI: 10.1142/8285.

Editing (**7**)

124. T. Puu, I. Sushko. Oligopoly and Complex Dynamics. Models and Tools, Springer, 2002.

125. G.-I. Bischi, I. Sushko. Dynamic Modelling in Economics and Finance, Special Issue of *Chaos, Solitons and Fractals* in honour of Professor Carl Chiarella, *Vol. 29, Issue 3*, 2006.

126. T. Puu, I.Sushko. Business Cycles Dynamics. Models and Tools, Springer, 2006.

127. A. Sharkovsky, I. Sushko. Proceedings of ECIT08, *Grazer Mathematische Berichte, No. 354,* 2009.

128. G.-I. Bischi, C. Chiarella, I. Sushko. Global Analysis of Dynamic Models for Economics, Finance and Social Sciences. Essays in Honour of Laura Gardini, Springer, 2013.

129. L. Gardini, I. Sushko. Nonlinear Dynamical Systems in Economic Modelling. Special Issue of *Discrete and Continuous Dynamical Systems Series B,* Vol. 26, No. 11, 2021.

130. J. S. Canovas, L. Gardini, A. Panchuk, I. Sushko, F. Tramontana. Dynamic Modelling in Economics and Finance, Special Issue of *Chaos, Solitons and Fractals* on Nonlinear Economic Dynamics: A tribute to Tönu Puu, 2022.

Abstracts (**59**)

131. V. L. Maistrenko, Yu. L. Maistrenko, I. A. Soroka, I. M. Sushko. Dynamics of the nonlinear difference equations with two deviations. *Abstracts of the XII Int. Conf. on Nonlinear Oscillations.* Krakow, 1990, 99-100.

132. I. M. Sushko. Two-dimensional piecewise linear endomorphisms: period adding phenomenon. *Abstracts of School-Conference DEBC-94, Institute of Mathematics, Academy of Sciences of Ukraine, Kiev, 1994,* 104.

133. I. Sushko, Yu. Maistrenko, L.Gardini. Chaotic attractors at the transition from invertible to noninvertable maps in a two-dimensional piecewise linear family. *Abstracts of European Conference on Iteration Theory*, September 8-14, 1996, Urbino, Italy.

134. I. Sushko, Yu. Maistrenko, U. Feudel. Influence of quasiperiodic forcing on synchronization processes. *Abstracts of Second Int. Conf. on Discrete Chaotic Dynamics in Nature and Society,* May 9-13, 2000, Odense, Denmark.

135. I. Sushko. On an example of irregular growth cycles model. *Abstracts of Int. Workshop on Dynamic Models in Economics and Finance (MDEF)*, Sept. 28-30, 2000, Urbino, Italy.

136. I. Sushko, T. Puu, L. Gardini. Business Cycles: The Hicksian Floor-Roof Model Revisited. *Abstracts of MDEF 2002,* Sept 26-28, 2002, Urbino, Italy.

137. I. Sushko, L. Gardini, T.Puu. Duopoly with Piecewise Linear Discontinuous Reaction Functions. *Abstracts of Italian Meeting on Game Theory and Application (XV IMGTA)*, July 9-12, 2003, Urbino, Italy.

138. I. Sushko, A. Agliari, L. Gardini. Bistability and Border-Collision Bifurcations for a Family of Unimodal Piecewise Smooth Maps. *Abstracts of MDEF 2004,* Sept 16-18, 2004, Urbino, Italy.

139. T. Puu, L. Gardini, I. Sushko. On the Change of Periodicities in the Hicksian Multiplier-Accelerator Model with a Consumption Floor. *Abstracts of MDEF 2004,* Sept 16-18, 2004, Urbino, Italy.

140. I. Sushko, L. Gardini, G.-I. Bischi. Border-Collision Bifurcations in a Duopoly Model with Capacity Limits. *Abstracts of Int. Workshop on Nonlinear Economic Dynamics*, July 28-30, 2005, Urbino, Italy.

141. I. Sushko, L. Gardini. Center bifurcation for a two-dimensional piecewise linear map. *Abstracts of ECIT 2006*, Gargnano, Italy, Sept. 10-16, 2006.

142. L. Gardini, A. Naimzada and I. Sushko. Growing Through Chaotic Intervals. *Abstracts of AMASES,* Sept. 2-6, 2007, Lecce, Italy.

143. L. Gardini, I. Sushko. On analogue of the center bifurcation at infinity. *Abstracts of ECIT 2008*, Sept. 7-13, 2008, Yalta, Ukraine.

144. L. Gardini, I. Sushko, A. Naimzada. Growing Through Chaotic Intervals. *Abstracts of MDEF 2008,* Sept. 25-27, 2008, Urbino, Italy.

145. I. Sushko, L. Gardini. Degenerate Bifurcations and Border Collision in One- and Two-dimensional Piecewise Smooth Maps. *Abstracts of Ukrainian Mathematical Congress*, Aug. 27-29, 2009, Kiev, Ukraine.

146. I. Sushko, L. Gardini. Center Bifurcation in the Lozi Map. *Abstracts of ECIT 2010,* Nant, France, 12-17 Sept., 2010.

147. I. Sushko, G.-I. Bischi, F. Lamantia. Border Collision Bifurcations in a simple oligopoly model with production constraints. *Abstracts of MDEF 2010*, Urbino, Italy, Sept. 23-25, 2010.

148. I. Sushko, A. Naimzada, L. Gardini. Cycles and Chaotic Attractors in an Infinitely Lived Agent Economy. *Abstracts of NED 2011*, Cartagena, Spain, June 1-3, 2011.

149. V. Avrutin, L. Gardini, A. Granados, M. Schanz, I. Sushko. Continuity Breaking and Intersection of Border Collision Bifurcations Curves Leading to Big-Bang Bifurcations. *Abstracts of ENOC 2011*, Roma, Italy, July 24-29, 2011.

150. L. Gardini, I. Sushko, V. Avrutin, M. Schanz. Critical homoclinic orbits lead to snap-back repellers. *Abstracts of NOMA 2011.* University of Evora, Portugal, Sep.15-16, 2011.

151. V. Avrutin, I. Sushko, L. Gardini. On cyclic and acyclic chaotic attractors. *Abstracts of NOMA 2011.* University of Evora, Portugal, Sep.15-16, 2011.

152. I. Sushko, L.Gardini. Border Collision Normal Forms for One- and Two-Dimensional Maps. *Abstracts of NOMA 2011.* University of Evora, Portugal, Sep.15-16, 2011.

153. V. Avrutin, L. Gardini, I. Sushko. Map Replacement Technique Revisited. *Abstracts of ECIT 2012*, Portugal, Ponta Delgada, Sept. 9-15, 2012.

154. L. Gardini, V. Avrutin, I. Sushko. Codimention-2 Border Collision Bifurcations in Lorenz Maps. *Abstracts of ECIT 2012*, Portugal, Ponta Delgada, Sept. 9-15, 2012.

155. I. Sushko, L. Gardini, K. Matsuyama. Bifurcation Structure in a Piecewise Smooth Map with Two Kink Points. *Abstracts of ECIT 2012*, Portugal, Ponta Delgada, Sept. 9-15, 2012.

156. A. Panchuk, V. Avrutin, B. Schenke, I. Sushko. Cycles and their bifurcations in a bimodal piecewise linear map. *Abstracts of ECIT 2012*, Portugal, Ponta Delgada, Sept. 9-15, 2012.

157. I. Sushko, P. Commendatore, I. Kubin. Global dynamics of a three-region new economic geography model. *Abstracts of MDEF 2012*, Urbino, Italy, Sept. 20-22, 2012.

158. P. Commendatore, A. Pinto, I. Sushko. A simple post-Keynesian model of growth with constraints on investment. *Abstracts of MDEF 2012*, Urbino, Italy, Sept. 20-22, 2012.

159. K. Matsuyama, I. Sushko and L. Gardini. A piecewise linear model of credit traps and credit cycles: a complete characterization. *Abstracts of MDEF 2012*, Urbino, Italy, Sept. 20-22, 2012.

160. I. Sushko. Bifurcation structure in a piecewise smooth map with two kink points. *Abstracts of SIAM Conference on Applications of Dynamical Systems*, Snowbird, Utah, USA, May 19-23, 2013.

161. V. Avrutin, L. Gardini, I. Sushko. Codimension-2 border collision bifurcations in Lorenz maps. *Abstracts of Euromech Colloquium n. 541*, Senigallia, Italy, June 3-6, 2013.

162. I. Sushko, P. Commendatore, I. Kubin, C. Petraglia. Dynamics of a New Economic Geography Model in the Presence of an Outside region. *Abstracts of NED2013,* Siena, Italy, July 4-6, 2013.

163. I. Kubin, P. Commendatore, I. Sushko. Trade agreements in a linear FE model: preliminary considerations on fixed points and dynamic properties. *Abstracts of MDEF 2014*, Urbino, Italy, Sept. 18-20.

164. P. Commendatore, P. Mossay, I. Kubin, I. Sushko. Dynamic agglomeration patterns in a 2-country 4-regions NEG model. *Abstracts of MDEF 2014*, Urbino, Italy, Sept. 18-20.

165. I. Sushko, F. Tramontana, F. Westerhoff, V. Avrutin. Bull and Bear market with different entry thresholds. *Abstracts of MDEF 2014*, Urbino, Italy, Sept. 18-20.

166. K. Matsuyama, I. Sushko, L. Gardini. Globalization and Synchronization of Innovation Cycles. *Abstracts of MDEF 2014*, Urbino, Italy, Sept. 18-20.

167. I. Sushko, P. Commendatore, I. Kubin, P. Mossay. Dynamics of a two-country New Economic Geography model with four regions. *Abstracts of NED 2015*, Tokyo, June 25-27.

168. I. Sushko, L. Gardini. 2D Border Collision Normal Form and Smale Horseshoe Construction. *Abstracts of Conference on Open Problems in Nonsmooth Dynamics*, 2016, Barcelona, Feb.1-5.

169. I. Sushko, L. Gardini, K. Matsuyama. Globalization and Coupled Chaotic Fluctuations of Innovation. *Abstracts of MDEF 2016*, Urbino, Italy, June 23-25.

170. P. Commendatore, I. Kubin, I. Sushko. A three-region NEG model with linear demand function. *Abstracts of MDEF 2016*, Urbino, Italy, June 23-25.

171. I. Sushko, L. Gardini, K. Matsuyama. Codimension-two bifurcations and robust chaos in a 1D piecewise smooth map. *Abstracts of ECIT 2016*, University of Innsbruck, Austria, Sept.4-10.

172. I. Sushko, L. Gardini. Smale Horseshoe in 2D Noninvertible Maps. *Abstracts of PODE 2017*, University of Urbino, May 29-31.

173. I. Sushko, L.Gardini. Snap-back repellers and critical homoclinic orbits. *Abstracts of ICDEA 2017*, University of Timisoara, July 24-28.

174. I. Sushko, L. Gardini, K. Matsuyama. Fashion Cycles: a Discrete Time Analysis. *Abstracts of NED 2017*, University of Pisa, Sept. 7-9.

175. I. Sushko, L. Gardini, K. Matsuyama. Globalization and Coupled Chaotic Fluctuations of Innovation. *Abstracts of AMASES-XLI*, University of Cagliari, Sept. 14-16, 2017.

176. I. Sushko, L. Gardini, K. Matsuyama. 2D discontinuous map: emergence of fashion cycles. *Abstracts of ICDEA 2018*, Technical University of Dresden, May 21-25.

177. L. Gardini, V. Manosa, I. Sushko. A route to chaos in the Boros-Moll map. *Abstracts of ICDEA 2018*, Technical University of Dresden, May 21-25.

178. P. Commendatore, I. Kubin, I. Sushko. The New Economic Geography of the Brexit. *Abstract of the International Conference "The Economy as a Spatial Complex System"*, University of Naples, June 21-22, 2018.

179. L. Gardini, I. Sushko. Growing through chaos in the Matsuyama map via subcritical flip and bistability. *Abstract of the International Conference "The Economy as a Spatial Complex System"*, University of Naples, June 21-22, 2018.

180. I. Sushko, L. Gardini, K. Matsuyama. Dynamics of a discrete-time fashion cycle model. *Abstract of the International Conference "The Economy as a Spatial Complex System"*, University of Naples, June 21-22, 2018.

181. I. Sushko, L. Gardini, K. Matsuyama. Dynamics of a generalized fashion cycle model. *Abstracts of MDEF 2018*, Urbino, Italy, Sept. 6-8.

182. P. Commendatore, I. Kubin, I. Sushko. Transport costs and structural change of a 4-location spatial economy. *Abstracts of MDEF 2018*, Urbino, Italy, Sept. 6-8.

183. A. Panchuk, I. Sushko, F. Westerhoff. A financial market model with two discontinuities: bifurcation structures in the chaotic domain. *Abstracts of MDEF 2018*, Urbino, Italy, Sept. 6-8.

184. I. Sushko, L. Gardini. Center bifurcation in the Lozi map. *Abstracts of ICDEA 2019*, University College London, UK, June 24-28.

185. K. Matsuyama, I. Sushko, L. Gardini. A Piecewise Linear Model of Credit Traps and Credit Cycles: A Complete Characterization, *Abstracts of NED 2019*, Kyiv, Ukraine, Sept.4-6.

186. I. Sushko, L. Gardini, M. Gallegati. The role of border collision bifurcations for emergence of business cycles. *Abstracts of ICDEA 2021*, University of Sarajevo, Bosnia and Herzegovina, July 26-30.

187. I. Sushko, L. Gardini, D. Radi, N. Schmitt, F. Westerhoff. Perception of fundamental values and financial market dynamics: Mathematical insights from a two-dimensional piecewise linear map. *Abstracts of NED 2021*, Catholic University of Milan, Italy, Sept.13-15.

188. I. Sushko, V. Avrutin, L. Gardini, Zh. T. Zhusubaliyev. Bifurcations of closed invariant curves in a 2D piecewise smooth map. *Abstracts of ECIT 2022,* University of Vienna, Reichenau an der Rax, Austria, June 13-17.

189. L. Gardini, D. Radi, N. Schmitt, I. Sushko, F. Westerhoff. Sentiment-driven financial market dynamics: Mathematical insights from a 2D nonsmooth map. *Abstracts of ICDEA 2022,* Paris-Saclay University, France, July 18-22.

190. L. Gardini, D. Radi, N. Schmitt, I. Sushko, F. Westerhoff. Sentiment-driven financial market dynamics: Mathematical insights from a 2D nonsmooth map. *Abstracts of MDEF 2022,* University of Urbino, Italy, Sept. 8-10.