

Roberto Dieci

PROFESSIONAL ADDRESS

Department of Mathematics, University of Bologna
P.zza di Porta S. Donato 5 - I-40126 Bologna (Italy)
and
School of Economics and Management
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www.webalice.it/rdieci/
<https://scholar.google.it/citations?user=hOJwatYAAAAJ&hl=en>

EDUCATION

Doctorate (Ph.D.) in Mathematics for Financial Markets, University of Brescia (Italy), June 1994
Degree (M.Sc.) in Economics and Business "cum laude", University of Parma (Italy), July 1989

PERMANENT POSITIONS

since 2007/10 - Full Professor of Mathematics for Economics and Finance, Department of Mathematics and School of Economics and Management, University of Bologna
2002/10 - 2007/09: Associate Professor of Mathematics for Economics and Finance, Department of Mathematics for Economics and Social Science and Faculty of Economics Rimini, University of Bologna
1995/11 - 2002/09: Assistant Professor of Mathematics for Economics and Finance, Faculty of Economics, University of Parma

OTHER POSITIONS

2002-2005: Adjunct Professor, Faculty of Economics, University of Parma
2000-2003: Adjunct Professor, University "L. Bocconi", Milano
1994-1995: Adjunct Professor, Faculty of Economics, University of Parma
1993-1994: Adjunct Professor, Faculty of Economics, University of Sassari

VISITING APPOINTMENTS

August 2012: Visiting Professor, UTS Business School, University of Technology Sydney.

September 2001: Visiting Scholar, School of Finance and Economics, University of Technology Sydney

RESEARCH

PUBLICATIONS

Journal articles

CANDELA G., CASTELLANI M., DIECI R. (2019). In search of leisure time: An endogenous growth model with leisure services. *METROECONOMICA*, 70, 488-524.

DIECI R., SCHMITT N., WESTERHOFF F. (2018). Interactions between stock, bond and housing markets. *JOURNAL OF ECONOMIC DYNAMICS & CONTROL*, 91, 43-70.

DIECI R., SCHMITT N., WESTERHOFF F. (2018). Steady states, stability and bifurcations in multi-asset market models. *DECISIONS IN ECONOMICS AND FINANCE*, 41, 357-378.

BISCHI G.I., DAWID, H., DIECI R., MATSUMOTO, A. (2017). Introduction to the special issue 'Nonlinear Economic Dynamics'. *JOURNAL OF EVOLUTIONARY ECONOMICS*, 27, 825-830 (*Editorial*)

DIECI R., WESTERHOFF F. (2016) Heterogeneous expectations, boom-bust housing cycles, and supply conditions: A nonlinear economic dynamics approach, *JOURNAL OF ECONOMIC DYNAMICS & CONTROL*, 71, 21-44.

DIECI R., WESTERHOFF F. (2013) On the inherent instability of international financial markets: natural nonlinear interactions between stock and foreign exchange markets. *APPLIED MATHEMATICS AND COMPUTATION*, 221, 306-328.

CHIARELLA C., DIECI R., HE X.-Z., LI K. (2013) An evolutionary CAPM under heterogeneous beliefs. *ANNALS OF FINANCE*, 9, 185-215.

CHIARELLA C., DIECI R., HE X.-Z. (2013) Time-Varying Beta: A Boundedly Rational Equilibrium Approach. *JOURNAL OF EVOLUTIONARY ECONOMICS*, 23, 609-639.

DIECI R., WESTERHOFF F. (2012) A simple model of a speculative housing market. *JOURNAL OF EVOLUTIONARY ECONOMICS*, 22, 303-329.

DIECI R., GALLEGATI M. (2011) Multiple attractors and business fluctuations in a nonlinear macro-model with equity rationing. *MATHEMATICAL AND COMPUTER MODELLING*, 53, 1298-1309.

CHIARELLA C., DIECI R., HE X.-Z. (2011) Do heterogeneous beliefs diversify market risk? *EUROPEAN JOURNAL OF FINANCE*, 17, 241-258.

CHIARELLA C., DIECI R., HE X.-Z. (2011) The dynamic behaviour of asset prices in disequilibrium: A survey, *INTERNATIONAL JOURNAL OF BEHAVIOURAL ACCOUNTING AND FINANCE*, 2, 101-139.

DIECI R., WESTERHOFF F. (2010) Interacting cobweb markets. *JOURNAL OF ECONOMIC BEHAVIOR & ORGANIZATION*, 75, 461-481.

DIECI R., WESTERHOFF F. (2010) Heterogeneous speculators, endogenous fluctuations and interacting markets: A model of stock prices and exchange rates. *JOURNAL OF ECONOMIC DYNAMICS & CONTROL*, 34, 743-764.

DIECI R., WESTERHOFF F. (2009) Stability analysis of a cobweb model with market interactions.

APPLIED MATHEMATICS AND COMPUTATION, 215, 2011-2023.

TRAMONTANA F., GARDINI L., DIECI R., WESTERHOFF F. (2009). The emergence of 'bull' and 'bear' dynamics in a nonlinear model of interacting markets. DISCRETE DYNAMICS IN NATURE AND SOCIETY, vol. 2009, doi:10.1155/2009/310471, 1-30.

ANGELINI N., DIECI R., NARDINI F. (2009) Bifurcation analysis of a dynamic duopoly model with heterogeneous costs and behavioural rules. MATHEMATICS AND COMPUTERS IN SIMULATION, 79, 3179 -3196.

CHIARELLA C., DIECI R., GARDINI L., SBRAGIA L. (2008) A Model of Financial Market Dynamics with Heterogeneous Beliefs and State-Dependent Confidence. COMPUTATIONAL ECONOMICS, 32, 55-72.

CANDELA G., CASTELLANI M., DIECI R. (2008) Economics of externalities and public policy. INTERNATIONAL REVIEW OF ECONOMICS, 55, 285-311.

AGLIARI A., DIECI R., GARDINI L. (2007) Homoclinic tangles in a Kaldor-like business cycle model. JOURNAL OF ECONOMIC BEHAVIOR & ORGANIZATION, 62, 324-347.

CHIARELLA C., DIECI R., HE X.-H. (2007) Heterogeneous expectations and speculative behavior in a dynamic multi-asset framework. JOURNAL OF ECONOMIC BEHAVIOR & ORGANIZATION, 62, 408- 427.

AGLIARI A., BISCHI G.I., DIECI R., GARDINI L. (2006) Homoclinic tangles associated with closed invariant curves in families of 2-D maps. GRAZER MATHEMATISCHE BERICHTS, 350, 1-14.

CHIARELLA C., DIECI R., GARDINI L. (2006) Asset price and wealth dynamics in a financial market with heterogeneous agents. JOURNAL OF ECONOMIC DYNAMICS & CONTROL, 30, 1755-1786.

DIECI R., FORONI I., GARDINI L., HE X.-Z. (2006) Market mood, adaptive beliefs and asset price dynamics. CHAOS, SOLITONS AND FRACTALS, 29, 520-534.

DIECI R., SORDI S., VERCELLI A. (2006) Financial fragility and global dynamics. CHAOS, SOLITONS AND FRACTALS, 29, 595-610.

WESTERHOFF F., DIECI R. (2006) The effectiveness of Keynes-Tobin transaction taxes when heterogeneous agents can trade in different markets: A behavioural finance approach. JOURNAL OF ECONOMIC DYNAMICS & CONTROL, 30, 293 -322.

AGLIARI A., BISCHI G.I., DIECI R., GARDINI L. (2005) Global bifurcation of closed invariant curves in two-dimensional maps: a computer-assisted study. INTERNATIONAL JOURNAL OF BIFURCATION AND CHAOS IN APPLIED SCIENCES AND ENGINEERING, 15, 1285-1328.

CHIARELLA C., DIECI R., GARDINI L. (2005) The dynamic interaction of speculation and diversification. APPLIED MATHEMATICAL FINANCE, 12, 17-52.

DIECI R., BISCHI G.I., GARDINI L. (2003) Routes to complexity in a macroeconomic model described by a noninvertible triangular map. CUBO, 5, 367-396.

CHIARELLA C., DIECI R., GARDINI L. (2002) Speculative behaviour and complex asset price dynamics: a global analysis. JOURNAL OF ECONOMIC BEHAVIOR & ORGANIZATION, 49, 173-197.

BISCHI G.I., DIECI R., GARDINI L. (2001) Multistability and role of noninvertibility in a business cycle model. CENTRAL EUROPEAN JOURNAL OF OPERATIONS RESEARCH, 9, 71-96.

BISCHI G.I., DIECI R., RODANO G., SALTARI E. (2001) Multiple attractors and global bifurcations in a Kaldor-type business cycle model. JOURNAL OF EVOLUTIONARY ECONOMICS, 11, 527-554.

CHIARELLA C., DIECI R., GARDINI L. (2001) Asset price dynamics in a financial market with fundamentalists and chartists. DISCRETE DYNAMICS IN NATURE AND SOCIETY, 6, 69-99.

DIECI R. (2001) Critical curves and bifurcation of absorbing areas in a financial model. NONLINEAR ANALYSIS, 47, 5265-5276.

DIECI R., BISCHI G.I., GARDINI L. (2001) From bi-stability to chaotic oscillations in a macroeconomic model. CHAOS, SOLITONS AND FRACTALS, 12, 805-822.

GALEOTTI M., DIECI R. (2000) A model of optimal financing decisions in a stochastic framework. JOURNAL OF STATISTICS & MANAGEMENT SYSTEMS, 3, 43-66

Edited volumes and Special Issues

BISCHI G.I., DAWID H., DIECI R., MATSUMOTO A. (Guest Editors). Special issue 'Nonlinear Economic Dynamics', JOURNAL OF EVOLUTIONARY ECONOMICS, 27(5), 2017.

DIECI R., HE X.-Z., HOMMES C. (Eds.). Nonlinear Economic Dynamics and Financial Modelling - Essays in Honour of Carl Chiarella. SPRINGER INTERNATIONAL PUBLISHING, SWITZERLAND 2014.

Book contributions

DIECI R., HE X.-Z. (2018) Heterogeneous-Agent Models in Finance. In: HOMMES C., LEBARON B. (Eds.) *Handbook of Computational Economics Volume IV – Heterogeneous-Agent Models*, Elsevier, 257 - 328.

DIECI R., WESTERHOFF F. (2013) Modeling House Price Dynamics with Heterogeneous Speculators. In: BISCHI G.I., CHIARELLA C., SUSHKO I. (Eds.) *Global Analysis of Dynamic Models in Economics and Finance*, Springer, 35-61.

ANGELINI N., DIECI R., NARDINI F. (2010) The role of market-clearing mechanisms in a simple heterogeneous-agent asset pricing model. In: PUU T., PANCHUK A. (Eds.) *Nonlinear Economic Dynamics*. NEW YORK: Nova Science Publishers, Inc, Chapter 5.

CHIARELLA C., DIECI R., HE X.-Z. (2010) A Framework for CAPM with Heterogeneous Beliefs. In: BISCHI G.I., CHIARELLA C., GARDINI L. (Eds.) *Nonlinear Dynamics in Economics, Finance and the Social Sciences*, Springer, 353-369.

TRAMONTANA F., GARDINI L., DIECI R., WESTERHOFF F. (2010) Global Bifurcations in a Three-Dimensional Financial Model of "Bull and Bear" Interactions. In: BISCHI G. I., CHIARELLA C., GARDINI L. (Eds.) *Nonlinear Dynamics in Economics, Finance and the Social Sciences*, Springer, 333- 352.

CHIARELLA C., DIECI R., HE X.-Z. (2009) Heterogeneity, Market Mechanisms, and Asset Price Dynamics. In: HENS T., SCHENK-HOPPE K.R. (Eds.) *Handbook of Financial Markets: Dynamics and Evolution*. North-Holland, 277-344.

AGLIARI A., DIECI R. (2006) Coexistence of attractors and homoclinic loops in a Kaldor-like business cycle model. In: PUU T., SUSHKO I. (Eds.) *Business Cycle Dynamics - Models and Tools*,

Springer, 223- 254.

CHIARELLA C., DIECI R., GARDINI L. (2005) Asset price dynamics and diversification with heterogeneous agents. In: LUX T., REITZ S., SAMANIDOU E. (Eds.) Nonlinear Dynamics and Heterogeneous Interacting Agents, LECTURE NOTES IN ECONOMICS AND MATHEMATICAL SYSTEMS, vol. 550, Springer, 251-267.

CHIARELLA C., DIECI R., GARDINI L. (2004) A dynamic analysis of speculation across two markets. In: GALLEGATI M., KIRMAN A., MARSILI M. (Eds.) The Complex Dynamics of Economic Interaction - Essays in Economics and Econophysics, LECTURE NOTES IN ECONOMICS AND MATHEMATICAL SYSTEMS, vol. 531, Springer, 197-212.

Working papers (unpublished)

DE GRAUWE P., DIECI R., GRIMALDI M. (2005). Fundamental and non-fundamental equilibria in the foreign exchange market: a behavioural finance framework. CESIFO WORKING PAPERS, vol. 1431. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=692021

PRESENTATIONS

Conferences and workshops (last 10 years)

Workshop MDEF 2018 (Dynamic Models in Economics and Finance), Urbino, September 2018.

ESHIA/WEHIA 2018 (23rd Annual Workshop on Economic Science with Heterogeneous Interacting Agents), International Christian University, Tokyo, 30 June - 2 July 2018.

CEF 2018 (24th International Conference on Computing in Economics and Finance), Catholic University, Milano, June 2018.

Workshop on "Interactions in complex economic systems: contagion, innovation and crises", Università Cà Foscari, Venezia, March 2018.

XLI AMASES Conference (Association for Mathematics Applied to Economics and Social Science), Cagliari, September 2017.

CEF 2017 (23rd International Conference on Computing in Economics and Finance), Fordham University, Lincoln Center Campus, New York City, June 2017.

ESHIA/WEHIA 2017 (22nd Annual Workshop on Economic Science with Heterogeneous Interacting Agents), Catholic University, Milano, June 2017.

Workshop "Handbook of Computational Economics Volume IV – Heterogeneous-Agent Models", Amsterdam School of Economics, University of Amsterdam, June 2017.

XXXVIII AMASES Conference (Association for Mathematics Applied to Economics and Social Science), Reggio Calabria, September 2014.

"Symposium on return predictability in stock and real estate markets", Scuola Normale Superiore, Pisa, Italy, June 2014

Workshop on "Deterministic and Stochastic Dynamics in Economics and Finance", Scuola Normale Superiore, Pisa, Italy, December 2013.

NED13 (8th International Conference on Nonlinear Economic Dynamics), Siena, Italy, July 2013

ESHIA/WEHIA 2013 (18th Annual Workshop on Economic Science with Heterogeneous Interacting Agents), Reykjavik, Iceland, June 2013

Workshop MDEF 2012 (Dynamic Models in Economics and Finance), Urbino, September 2012.

ESHIA/WEHIA 2011 (16th Annual Workshop on Economic Heterogeneous Interacting Agents), Ancona, June 2011.

NED11 (7th International Conference on Nonlinear Economic Dynamics), Cartagena, Spain, June 2011.

International Conference on Nonlinear Economic Dynamics and Financial Market Modelling, Guangzhou, China, April 2011.

Workshop MDEF 2010 (Dynamic Models in Economics and Finance), Urbino, September 2010.

The Rimini Conference in Economics and Finance (RCEF), Rimini, June 2010.

Workshop "Evolution and Market Behavior in Economics and Finance", Scuola Superiore Sant'Anna, Pisa, October 2009.

Invited seminars

University of Technology Sydney, Catholic University of Leuven, University of Bielefeld, Catholic University "Sacro Cuore" (Milano, Piacenza), University of Siena, University of Urbino, University of Roma "La Sapienza", University of Firenze, University of Calabria

CONFERENCE PROGRAM (SCIENTIFIC) COMMITTEE or ORGANISING COMMITTEE

MDEF 2018 (Dynamic Models in Economics and Finance), Urbino, September 2018

MDEF 2016 (Dynamic Models in Economics and Finance), Urbino, September 2016

MDEF 2014 (Dynamic Models in Economics and Finance), Urbino, September 2014

NED 2013 (Nonlinear Economic Dynamics), Siena, July 2013

International Workshop on: Nonlinear dynamics, agent-based models, and complex evolving systems in economics, Bologna, June 2013, <http://nldabm2013.dm.unibo.it/> (**Organizer**)

MDEF 2012 (Dynamic Models in Economics and Finance), Urbino, September 2012

MDEF 2010 (Dynamic Models in Economics and Finance) Urbino, September 2010

MAFIN 09 (First International Workshop on Managing Financial Instability in Capitalistic Economies), Reykjavik, September 2009

MDEF 2008 (Dynamic Models in Economics and Finance) Urbino, September 2008

EDITORIAL BOARDS

Associate Editor, *Journal of Economic Behavior & Organization* (since November 2013).

Member of the Editorial Board, *Nonlinear Dynamics, Psychology, and Life Sciences* published by the Society for Chaos Theory in Psychology and Life Sciences (since 2010),

RESEARCH GRANTS AND COORDINATION OF RESEARCH GROUPS

2013-2015. Member of the COST Action (European Cooperation in Science and Technology) IS1104 "The EU in the new complex geography of economic systems: models, tools and policy evaluation", Chair Prof. Pasquale Commendatore, supported by the EU.

2011-2013. Head of the Research Unit of Bologna, National Project (MIUR-PRIN 2009): "Local interactions and global dynamics in economics and finance: models and tools", (National Coordinator: Prof. Laura Gardini, University of Urbino).

2008-2010. Scientific Coordinator of a Research Project on "Complexity and financial crises", under financial support from University of Bologna - Polo Scientifico-Didattico di Rimini.

2005-06. Head of the Research Unit of Bologna, National Project (MIUR-PRIN 2004): "Nonlinear models in Economics and Finance: interactions, complexity and forecasting" (National Coordinator: Prof. Laura Gardini).

2003-04. Head of the Research Unit of Bologna, National Project (MIUR-PRIN 2002): "Nonlinear models in Economics and Finance: complex dynamics, disequilibrium, strategic interaction" (National Coordinator: Prof. Laura Gardini).

2001-02. Head of the Research Unit of Parma, National Project (MIUR-PRIN 2000): "Dynamic models in Economics and Finance: evolution, uncertainty and forecasting" (National Coordinator: Prof. Laura Gardini)

OTHER PROFESSIONAL ACTIVITIES

Hiring committees

2014-2018: Member of hiring committees for positions of Associate Professor in Mathematics for Economics and Finance at: University of Bologna, University of Milano-Bicocca, Catholic University of Milano, Scuola Normale Superiore - Pisa, University of Firenze.

PhD thesis examiner / committee member

PhD in Finance, UTS Business School, University of Technology Sydney, August 2014 (*Qi Nan Zhai*)

PhD in Finance, Leeds University Business School, June 2014 (*Tongya Wang*)

PhD in Economic Policy, Catholic University Milano, December 2013 (*Nicolò Pecora*)

PhD in Finance, School of Finance and Economics, University of Technology Sydney, Australia, August 2010 (*Lei Shi*)

PhD in Economic Policy, Catholic University Milano, June 2009 (*Alessandra Cornaro*)

PhD in Economic Policy, Catholic University Milano, March 2005 (*Lucia Sbragia*)

PhD in Economics, Katholieke Universiteit Leuven, September 2004 (*Marianna Grimaldi*)

Referee / reviewer services

Journals: The Manchester School; Economic Journal; Journal of Economic Behavior & Organization; Journal of Economic Dynamics & Control (*awarded as JEDC 'Outstanding Referee' for 2012, 2014 and 2015*); Macroeconomic Dynamics; Chaos Solitons & Fractals; Studies in Nonlinear Dynamics & Econometrics; European Journal of Operational Research; Journal of Economic Interaction and Coordination; Journal of Evolutionary Economics; Economics Letters;

Economic Modelling; PLOS ONE; Nonlinear Dynamics Psychology and Life Sciences; Mathematics and Computers in Simulation; Applied Mathematics and Computation; Chaos; Mathematical Finance; Annals of Finance; Computational Economics; Decisions in Economics and Finance; Discrete Dynamics in Nature and Society; Complexity; International Journal of Bifurcation and Chaos; Mathematical Problems in Engineering; Quantitative Finance; The Quarterly Review of Economics and Finance; International Review of Economics and Finance; International Review of Financial Analysis; Economics E-Journal; JSTAT; Macroeconomics and Finance in Emerging Market Economies; The B.E. Journal of Theoretical Economics; Journal of Economic Theory; Eastern Economic Journal; American Journal of Agricultural Economics; Communications in Nonlinear Science and Numerical Simulation;

Other: ISF (Israel Science Foundation), Society for Computational Economics, Oxford University Press.

Reviewer for *Mathematical Reviews* (American Mathematical Society) since 2007

TEACHING EXPERIENCE

Lectures at undergraduate level

Mathematics I, Mathematical Methods for Economics, Financial Mathematics, Portfolio Theory

Lectures at graduate level

Financial Mathematics, Mathematics for Economics

PhD level

Member of the academic board of the PhD Program in Mathematics - University of Bologna, from 2013 to 2018

Lecturer within the Tutorial Workshop Discrete Dynamical Systems and Applications, Urbino, 2010

Lecturer within the 3rd International School Topics in Nonlinear Dynamics: Discrete Dynamical Systems and Applications, Urbino, 2004.

Bologna, 14 June 2019

Roberto Dieci

LAURA GARDINI
- CURRICULUM -

DATI PERSONALI.

Posizione attuale: Professore Ordinario di Matematica Finanziaria
presso l'Università degli Studi di Urbino, Facoltà di Economia,
Dipartimento di Economia, Società, Politica.
Via Saffi 42, 61029 Urbino.
(Settore scientifico disciplinare ex SECS-S/06 ora 13/D4 "Metodi Matematici
dell'Economia e delle Scienze Attuariali e Finanziarie")

STUDI.

1971 - Diploma di Maturità Scientifica conseguita a Ravenna.
1975 - Laurea in Matematica, con Lode, conseguita presso l'Università degli Studi di Bologna
l' 1/7/1975, discutendo una tesi con il prof. G. C. Barozzi.
1979 - Ha seguito un corso su "Problemi di Ottimizzazione" (Prof. Dixon, Politecnico MI).
1982 - Ha seguito il terzo corso CIME "Fluid Dynamics".

POSIZIONI.

1974-1975 Vincitrice di una borsa di studio per laureandi, Università di Bologna.
1975-1976 Vincitrice di una borsa di studio per neo-laureati, Università di Bologna.
1977-1987 Ricercatrice E. N. I. Presso la SOGESTA S.p.A. (Urbino),
e dal 1981 presso la TEMA S.p.A. (Bologna).
1984/85, 1985/86 e 1986/87 Professore a contratto, per il corso di Meccanica Razionale, presso
la Facoltà di Ingegneria dell'Università di Ancona.
Dal 2/11/1988 al 1/11/1992 Ricercatore Universitario per il gruppo di discipline n.93 (Matematica Generale)
presso la Facoltà di Economia e Commercio dell' Università di Urbino.
Dal 1/11/1992 al 31/10/1994 Professore Associato (raggruppamento P050, Matematica per le Decisioni
Economiche e Finanziarie) presso la Facoltà di Scienze Politiche dell'Università di Macerata, per
l'insegnamento di Matematica Generale, nel corso di laurea in Economia Bancaria Finanziaria e
Assicurativa.
Dal 1/11/1993-all'1-11-2000 Professore a Contratto per l'insegnamento di "Matematica Finanziaria" presso la
Facoltà di Economia dell'Università di Urbino.
Dal 1/11/1994 al 31/10/1997 Professore Straordinario (raggruppamento P0500, Matematica per le decisioni
Economiche e Finanziarie) presso la Facoltà di Economia dell'Università di Brescia, Dipartimento di

Metodi Quantitativi. Dal 1995 inquadrata nel settore scientifico-disciplinare S04B-Matematica Finanziaria e Scienze Attuariali. di Parma, Istituto di Matematica.

Dal 1/11/1997 al 31/10/2000 Professore Ordinario di Matematica Finanziaria (Settore Disciplinare S04B) presso la Facoltà di Economia dell'Università di Parma.

Dal 1/11/2000 Professore Ordinario di Matematica Finanziaria (Settore Disciplinare SECS-S/06) presso la Facoltà di Economia (ora Scuola di Economia) dell'Università di Urbino Carlo Bo, Dipartimento di Economia, Società e Politica.

AFFILIAZIONI - INCARICHI.

Dal 1984 aderisce al Gruppo Nazionale per la Fisica Matematica.

Nel periodo 1989-91 ha aderito al Gruppo Nazionale 40% del M.U.R.S.T. "Modelli Nonlineari in Economia e Dinamiche Complesse".

Nel periodo 1991-92 ha aderito al Gruppo Nazionale 40% del M.U.R.S.T. "Dinamiche Nonlineari ed Applicazioni alle Scienze Economiche e Sociali".

Nel periodo 1992-2000 aderisce a progetti di ricerca del CNR.

Dal 1976 socio U.M.I. (Unione Matematica Italiana).

Dal 1993 socio E.M.S. (European Mathematical Society).

Dal 1989 socio A.M.A.S.E.S. (Assoc. Matematica Applicata alle Scienze Economiche e Sociali).

1995-1998 Responsabile Scientifico di un Progetto Bilaterale (Italia-Francia-Ukraina) del CNR.

Dal 1994 è membro della New York Academy of Sciences.

Dal 1996 è membro del Comitato Scientifico dell' "European Conference on Iteration Theory"

Dal 1995 è membro dell'IFNL (International Federation of Nonlinear Analysts).

Dal 2009 è membro del Comitato Scientifico del "Nonlinear Maps and Applications"

2001-2011 è ASSOCIATE EDITOR del Journal of Economic Behaviour and Organization

Dal 2009 è ASSOCIATE EDITOR della rivista "Mathematics and Computers in Simulation"

2010-2017 ASSOCIATE EDITOR della rivista "Economics Research International"

Dal 2014 al 2017 member of the Editorial Board of the "Journal of Applied Mathematics"

Dal 2014 member of the Editorial Board of the "International Journal of Economics and Statistics"

Dal 2014 al 2016 member of the Editorial Board of the International Journal

"Mathematical Problems in Engineering"

Dal 2015 member of the Editorial Board of the International Journal

"Journal of Difference Equations and Applications"

Dal 2015 a marzo 2019 member of the International Advisory Editors Board of the International

Journal "Communications in Nonlinear Science and Numerical Simulations"

2015-2016 Editor in Chief of the International Journal "Frontiers in Dynamical Systems"

(Frontiers in Applied Mathematics and Statistics Section *Dynamical Systems*)

Dal 2016 member of the Editors Board of the International Journal "SpringerPlus" (ma non partito)

Da Luglio 2018 Associate Editor della rivista internazionale

Journal of Economic Interaction and Coordination

Da Dicembre 2018 Associate Editor della rivista internazionale Journal of Dynamic Games

Da marzo 2019 Associate Editor of the International Journal

“Communications in Nonlinear Science and Numerical Simulations”

Da Febbraio 2010: Eletta nel Comitato Scientifico della SICC (Società Italiana di Caos e Complessità) (terzo mandato)

Da Gennaio 2012: Membro dell'Accademia Marchigiana Scienze Lettere ed Arti

Dal Settembre 2018 eletta Presidente del Comitato Scientifico dell' "European Conference on Iteration Theory"

Dal Maggio 2019 eletta nel Board of Directors della società Internazionale ISDE (International Society of Difference Equations)

Incarichi in Ateneo

Da marzo 2013 a ottobre 2016: eletta Coordinatore della Scuola di Economia

Da novembre 2016 a ottobre 2018: eletta Presidente della Scuola di Economia

Dal marzo 2013 a ottobre 2018: membro della Giunta del Dipartimento DESP

2014 Presidente del seggio per l'Elezione del Rettore (2 giornate in maggio, 2 giornate in giugno)

2014: Presidente Seggio N.4 per le votazioni studentesche del 22-23 ottobre 2014

DR n.90/2015 Presidente della commissione preposta alla valutazione delle domande relative alla procedure di selezione per l'attribuzione dell'incentivo una tantum per l'anno 2011 (17 febbraio – 17 aprile, 2015).

DR n.196/2015 Nomina a componente del gruppo di lavoro a sostegno del prorettore ai processi formativi Anna Teresa Ossani. (Membro della Commissione Didattica di Ateneo, del prorettore alla formazione Anna Ossani, dal novembre 2014, ufficialmente da aprile 2015).

DR n. /2016 Nomina a componente del gruppo CommOFF

DR n. /2016 Nomina a componente del gruppo DiCulTHer 2016 o 2015 ?

DR n. /2017 Nomina a componente del gruppo di lavoro ristretto CommOFF

DR n./2017 Nomina a referente del gruppo DiCulTHer 2017 (al posto di Vetrano)

DR n. /2017 Nomina a componente del gruppo di monitoraggio Programmazione Triennale

D.R. n. 480 del 9 ottobre 2017: Nomina a componente della Commissione per la Formazione degli Insegnanti.

REFEREE per diverse riviste nazionali ed internazionali (Mathematical Reviews, International Journal of Bifurcation and Chaos, Nonlinear Analysis T.M.&A., Journal of Economic Behaviour and Organization, Journal of Economic Dynamic and Control, Discrete Dynamics in Nature and Society, IEEE Transactions on Circuits and Systems, Discrete and Continuous Dynamical Systems, Physica A, D, Physics Letters A, Communications in Nonlinear Science and Numerical Simulations, CHAOS, Chaos Solitons & Fractals, Nonlinearity, Nonlinear Dynamics).

- Tolosa. (ottobre 1992), Membro della Giuria, per la discussione della tesi di dottorato (PHD) in "Matematique Appliquées" dell' Università Paul Sahatier, del Dott. Tony Narayaninsamy.

- Referee della tesi di dottorato (PHD) in "Mathematics" dell'Università di California, Santa Cruz, del Dott. Ronald Joe Record (Fehrhain 1994).
- 1994-2000 Membro del Collegio dei Docenti del Dottorato di Ricerca "Matematica per l'analisi dei mercati finanziari" (sede amministrativa Università di Brescia, sedi consorziate: Università di Torino e di Udine).
- Membro della Commissione Nazionale per l'ammissione al X ciclo del Dottorato di Ricerca (in Matematica per l'analisi dei mercati finanziari), presso l'Università di Brescia. (1994/5).
- Tolosa (ottobre 1995, Referee della tesi e Membro della Giuria, per la discussione della tesi di dottorato (PHD) in "Automatique, Génie Informatique, Traitement du Signal" dell'Università Paul Sabatier, della Dott.ssa Nathalie Gicquel.
- Membro della Commissione Nazionale per l'ammissione all'XI ciclo del Dottorato di Ricerca (in Metodi Computazionali per le Decisioni e Previsioni Finanziarie), presso l'Università di Bergamo (1995/6).
- 1995-1996 Responsabile Scientifico di un Progetto Coordinato del CNR, Unità locale di Brescia, ricerca dal titolo: "Applicazioni della teoria dei sistemi dinamici all'economia e alla finanza".**
- Organizzatore responsabile dell' "European Conference on Iteration Theory 1996" (svoltosi in Urbino 8-14 settembre 1996).
- 1996-1997 Responsabile Scientifico di un Progetto Coordinato del CNR, Unità locale di Brescia, titolo della ricerca: "Applicazioni della teoria dei sistemi dinamici all'economia e alla finanza".**
- Membro della Commissione Nazionale Giudicatrice per il conferimento del titolo di Dottore di Ricerca per il dottorato in "Metodi computazionali per le decisioni e previsioni economiche e finanziarie (X ciclo)", Università di Bergamo, e per il dottorato in "Matematica per l'analisi dei mercati finanziari (X ciclo)", Università di Brescia. Giugno 1997.
- Presidente della Commissione Giudicatrice per gli esami di stato di abilitazione all'esercizio della professione di Dottore Commercialista. Sessione di Maggio 1997, Università di Brescia.
- Membro del Comitato Scientifico del gruppo "Economics with Heterogeneous Interacting Agents".
- Tolosa. (26 maggio 1998), Membro della Giuria, per la discussione della tesi di Diploma di Ricerca dell'INSA del candidato Heba Abdel-Baset.
- 1997-1998 Responsabile Scientifico di un Progetto Coordinato del CNR, Unità locale di Brescia, titolo della ricerca: "Comportamenti dinamici in mappe razionali e loro applicazioni a modelli economici e finanziari".**
- Membro Interno nella Commissione Nazionale per il concorso pubblico per un posto da Ricercatore Universitario nel raggruppamento S04B presso l'Università di Parma (Dicembre 1998).
- 1998-1999 (PRIN) Responsabile Scientifico Dell'Unità di Ricerca di Parma, per il progetto di ricerca scientifica di interesse nazionale, cofinanziato dal MURST. Titolo della ricerca: "Dinamiche globali in modelli socio-economici in tempo discreto" (responsabile nazionale Prof. F. Gori).**
- 1999-2000 Responsabile Scientifico di un Progetto Coordinato del CNR, Unità locale di Parma.**
- Membro nella Commissione Nazionale per il concorso pubblico per un posto di I fascia nel settore Scientifico Disciplinare S04B bandito dall'Università di Firenze (1999).
- Componente della Commissione per i Giudizi di Conferma di Ricercatore Universitario per il biennio 2000-2001 Settore Scientifico Disciplinare S04B.
- Membro nella Commissione Nazionale per il concorso pubblico per un posto di I fascia nel settore Scientifico Disciplinare S04B bandito dall'Università di Modena (2000).
- Dal Rettore dell'Università degli Studi di Urbino, nominata **Membro del Nucleo di Valutazione Interna dell'Ateneo per il triennio 2000-2003.**

- **2000-2001 (PRIN) Coordinatore Nazionale** per il progetto di ricerca scientifica di interesse nazionale, cofinanziato dal MURST, dal titolo “Modelli dinamici in economia e finanza: evoluzione, incertezza e previsioni” con sedi locali a Urbino, Parma, Firenze, Milano, Torino e Macerata.

Nell’ambito del medesimo Progetto, Responsabile Scientifico dell’Unità di Ricerca di Urbino, titolo della ricerca: “Modelli matematici per la selezione degli equilibri in modelli dinamici non lineari, deterministici e stocastici, in economia e finanza”.

- Membro nella Commissione Nazionale per il concorso pubblico per un posto di II fascia nel settore Scientifico Disciplinare S04B bandito dall’Università di Bergamo (2001).

- Membro della Commissione Nazionale Giudicatrice per il conferimento del titolo di Dottore di Ricerca per il dottorato in "Metodi computazionali per le decisioni e previsioni economiche e finanziarie (XIV ciclo)", Università di Bergamo, Febbraio 2002.

- Membro nella Commissione Nazionale per il concorso pubblico per un posto di I fascia nel settore Scientifico Disciplinare SECS-S/06 bandito dall’Università di Firenze (2002).

- **2002-2003 (PRIN) Coordinatore Nazionale** per il progetto di ricerca scientifica di interesse nazionale, cofinanziato dal MURST, dal titolo “Modelli nonlineari in economia e finanza: dinamiche complesse, disequilibrio ed interazioni strategiche ” con sedi locali a Urbino, Parma, Firenze, Milano, Torino, Macerata, Foggia e Sassari.

Nell’ambito del medesimo Progetto, Responsabile Scientifico dell’Unità di Ricerca di Urbino, titolo della ricerca: “Metodi analitici e computazionali per modelli dinamici con agenti interagenti in economia e finanza ”.

- **2003-2006 (FIRB) Coordinatore Locale** dell’Unità di Urbino per il progetto di ricerca scientifica di base dal titolo “Modelli avanzati multiagente di sistemi finanziari ed economici”, coordinatore nazionale prof. Michele Marchesi, sedi di Urbino, Genova, Cagliari.

- Dal Rettore dell’Università degli Studi di Urbino, **nominata Membro del Nucleo di Valutazione Interna dell’Ateneo per il triennio 2004-2006.**

- **Scientist in charge nel Marie Curie International Fellowship, within the 6th European Community Framework Programme, Contract N. MIF1-CT-2004-510031** (per 1 anno di collaborazione di ricerca con Iryna Sushko da settembre 2004 a settembre 2005).

- **2004-2006 (PRIN) Coordinatore Nazionale** per il progetto di ricerca scientifica di interesse nazionale, cofinanziato dal MURST, dal titolo “Modelli nonlineari in economia e finanza: interazioni, complessità e previsioni ” con sedi locali a Urbino, Parma, Firenze, Milano, Torino, Macerata, Foggia e Sassari.

Nell’ambito del medesimo Progetto, Responsabile Scientifico dell’Unità di Ricerca di Urbino, titolo della ricerca: “Tecniche analitiche e computazionali per lo studio della complessità in modelli dinamici per l’economia e la finanza ”.

2009-2010 National Coordinator of a Project of Relevant Interest of the Italian Ministry of University MURST (PRIN) prot. 2009NZNM7C. Title of the research “Local interactions and global dynamics in economics and finance: models and tools”, coordinator of the groups of Urbino, Bologna and Cosenza.

- **Scientist in charge nel Marie Curie International Fellowship, within the 7th European Community Framework Programme, Contract Agreement N. PIEF-GA-2011-300281** (per 2 anni di collaborazione di ricerca con Viktor Avrutin nel periodo primo luglio 2012 al 30 ottobre 2014).

ISCH COST Action IS1104 - The EU in the new complex geography of economic systems: models, tools and policy evaluation, dal 1 giugno 2012 (durata 4 anni). Member of the Management Committee per l’Italia.

ATTIVITA' DIDATTICA.

- Numerosi seminari e cicli di lezioni sono state svolte presso le società del Gruppo E.N.I. sui temi documentati nei Rapporti Interni (Ottimizzazione, Stima parametrica, Risoluzione numerica di sistemi di equazioni

differenziali ordinarie, Risoluzione numerica di sistemi a derivate parziali, Sistemi Dinamici e Teoria delle Biforcazioni).

- Didattica per il corso di "Meccanica Razionale": ha scritto le Dispense (adottate, unitamente a libri di testo, nei tre anni accademici in cui ha tenuto il corso) di: "Elementi di Algebra delle Matrici e Calcolo Vettoriale"; "Elementi di Meccanica Analitica"; "Elementi di Meccanica dei Continui Deformabili".

- Attività seminariale, su un argomento monografico, dal titolo "Equazioni alle differenze lineari", per gli studenti della Facoltà di Economia di Urbino (A.A. 88/89, 89/90).

Ha svolto attività seminariale di avviamento alla ricerca tenendo:

- Un ciclo di 4 seminari presso il Dip. di Matematica della Fac. di Ingegneria dell'Università di Ancona sul tema "Biforcazioni Globali in Sistemi Dinamici Continui e Discreti" indirizzato in particolare a dottorandi e ricercatori (marzo-maggio, 1990).

- Due lezioni presso il Dip. di Scienze Economiche della Fac. di Economia e Commercio dell'Università di Ancona, sul tema "Dinamiche Complesse in Modelli Alle Differenze Nonlineari, indirizzate ai dottorandi di tale facoltà, illustrando i risultati tecnici con esempi di interesse nelle applicazioni economiche (maggio, 1990).

- A.A. 92/93, 93/94 Titolare del corso di Matematica Generale, Fac. di Scienze Politiche, Corso di Laurea in Economia Bancaria Finanziaria ed Assicurativa, Università di Macerata.

- Dall'A.A. 93/94 all'A.A. 1999/2000 tiene a contratto il corso di Matematica Finanziaria, Fac. di Economia, Università di Urbino.

- Dall'A.A. 94/95 all'A.A. 96/97 tiene il corso di Matematica Generale, Fac. di Economia, Università di Brescia.

- Ciclo di lezioni "Introduzione alla teoria dei sistemi dinamici" per gli studenti del Dottorato di Ricerca delle Università di Brescia e Bergamo (in Matematica per le applicazioni economiche e finanziarie) (Maggio 1996, Maggio 1997).

- Nell'A.A. 1997/98 ha tenuto per affidamento un modulo didattico di 20 ore dal titolo "Sistemi dinamici complessi nelle applicazioni economiche" nell'ambito del corso "Matematica per l'Economia" presso la Facoltà di Economia dell'Università di Catania.

- Dall'A.A. 97/98 all'A.A. 1999/2000 tiene il corso di Matematica Finanziaria, Fac. di Economia, Università di Parma.

- Dall'A.A. 2000/2001 tiene il corso di Matematica Finanziaria, Fac. di Economia, Università di Urbino.

- Anno di Congedo per motivi di studio (anno sabbatico): novembre 2009-ottobre 2010.

SEMINARI.

- Università di Siena. Fac. di Scienze Bancarie, Dip. di Economia (6 marzo 1991): seminario dal titolo "Investimenti, indebitamento, fluttuazioni del reddito e comportamenti caotici".

- Università di Macerata, C.d.L. in Economia Bancaria, Fin. ed Ass., Ist. di Economia (11 aprile 1991); seminario dal titolo "La modellistica matematica nell'economia".

- Università di Macerata, C.d.L. Economia Bancaria, Fin. ed Ass. (9 maggio 1991); seminario dal titolo "Comportamenti regolari e complessi in modelli economici".

- Università di Ancona, Fac. di Ingegneria, Dip. di Matematica (15 maggio 1991); seminario dal titolo "Biforcazioni globali in endomorfismi del piano ed applicazioni economiche".

- Università di Macerata, C.d.L. in Economia Bancaria, Fin. ed Ass., Ist. di Economia (aprile-maggio 1992), tre seminari rivolti agli studenti del primo e secondo anno, sulle applicazioni della matematica nelle Scienze Economiche.

- Università di Ancona, Fac. di Ingegneria, Dip. di Matematica (13 maggio 1992); seminario dal titolo "Aree assorbenti e loro biforcazioni globali".

- Università di Parma, Fac. di Matematica (ottobre 1994); seminario dal titolo "Biforcazioni in mappe non invertibili".
- Università di Bologna, Fac. di Economia (maggio 1995); seminario dal titolo "Biforcazioni in mappe di R^1 ed R^2 ed applicazioni".
- Università di Bologna, Fac. di Matematica (marzo 1996); relazione su invito.
- Università di Catania, Fac. di Economia (marzo 1997); relazione su invito.
- Università di Urbino, Fac. di Economia (maggio 1997); seminario dal titolo "Cicli e loro bacini di attrazione in giochi di duopolio"
- Technische Universität di Vienna, Institut für Ökonometrie, Operations Research und Systemtheorie (ottobre 1997); due seminari dal titolo "Non invertible two dimensional maps. Theory and Applications".

COLLABORAZIONI.

- I.N.S.A. (Institut National des Sciences Appliquées), Tolosa (aprile 1991, aprile 1992, maggio 1993); seminari sulle Biforcazioni globali in endomorfismi del piano con l'uso delle linee critiche e collaborazione di ricerca su diversi temi relativi al comportamento dinamico di endomorfismi del piano (Prof. C. Mira e collaboratori).
- Ukrainian Academy of Sciences, Kiev, Dept. of Mathematics. Collaborazione dal 1993 per lo studio delle proprietà di mappe lineari a tratti bidimensionali, non invertibili (Prof. Y. Maistrenko e collaboratori).
- Università di California, Santa Cruz, Dept. of Mathematics. Collaborazione per lo studio e la divulgazione di comportamenti caotici in mappe piane non invertibili, con l'aiuto di mezzi audiovisivi: Videocassette e CD-Rom (Prof. R. Abraham e collaboratori).
- Institute for Applied Mathematics & Cybernetics, Nizhny Novgorod, Russia, collaborazione per lo studio di biforcazioni omocline, di cicli sella, in mappe non invertibili (Prof. L. Shilnikov).
- 18-20 Settembre 1995, all'I.N.S.A. per collaborazione di ricerca, su invito del prof. C. Mira.
- 20-22 Febbraio 1997, all'I.N.S.A. per collaborazione di ricerca, su invito del prof. C. Mira e Daniele Fornier Prunaret, per lo studio delle dinamiche in mappe del piano non definite dappertutto (focal points and prefocal curves).
- Dal marzo 1997 collaborazione di ricerca con il Prof. Erik Mosekilde, Direttore del Department of Physics, Technical University of Denmark, Lyngby, per dinamiche in modelli discreti con problemi di riddled basins e symmetry breaking.
- Dalla primavera 1997 collaborazioni di ricerca con Tonu Puu (Department of Economics, University of Umea, Svezia).
- 28-29 ottobre 1997. Stage presso la Technical University di Vienna per ricerche con il prof. Gustav Feichtinger (Direttore dell'Institut für Ökonometrie, Operations Research und Systemtheorie) su mappe del piano in modelli di ricerca operativa ed il prof. Michael Kopel su modelli di competizione di mercato.
- 4-7 febbraio 1998. Stage presso il Department of Electrical Engineering, Swiss Federal Institute of Technology (EPFL), Losanna, per collaborazione di ricerca, su invito per prof. Martin Hasler.
- 11-14 Febbraio 1998, all'I.N.S.A. per collaborazione di ricerca, su invito del prof. C. Mira e Daniele Fornier Prunaret, per lo studio di "focal points and prefocal curves".
- Dalla primavera 1998 collaborazioni di ricerca con Cars Hommes (Department of Economics, University of Amsterdam, Olanda).
- Dalla primavera 1998 collaborazioni di ricerca con Carl Chiarella (School of Finance and Economics, University of Technology, Sydney, Australia).

ORGANIZZAZIONE di CONVEGNI

Organizza l'European Conference on Iteration Theory (ECIT-1996) nel settembre 1996 a URBINO.

Organizza il Convegno AMASES, Settembre 1996 a URBINO.

Organizza una Special Session sui "Discrete Dynamical Systems" all'I.M.A.C.S. World Congress, BERLINO, Agosto 1997

Organizza una Special Session su Noninvertible maps and their applications al WCNA, CATANIA, July 2000

Organizza il 1° Workshop MDEF (Modelli Dinamici in Economia e Finanza), a URBINO, Sett. 2000

Organizza il Workshop "Business Cycles ", URBINO, Febbraio 2001.

Organizza il Workshop "Dynamic Games ", URBINO, Febbraio 2002

Organizza una invited section alla Conferenza SIMAI, "Iterated Noninvertible Maps as Discrete Dynamical Systems", Chia Laguna, Sardegna, Maggio 2002.

Organizza il 2° Workshop MDEF (Modelli Dinamici in Economia e Finanza), a URBINO, Sett. 2002

Organizza il Workshop "Endogenous approaches to business cycles", URBINO 11 Marzo 2003

Organizza il XV Italian Meeting on Game Theory and Applications, URBINO, Luglio 2003

Organizza una sessione "Discrete Dynamic Models in Economics and Finance" al Workshop "Nonlinear Dynamics in Economics", Trieste, 5-6 Giugno 2004.

Organizza (in collaborazione con la SICC) la 3rd International School Topics in Nonlinear Dynamics
DISCRETE DYNAMICAL SYSTEMS AND APPLICATIONS, URBINO, 7-8-9 Luglio 2004.

Organizza il 3° Workshop MDEF (Modelli Dinamici in Economia e Finanza), a URBINO, Sett. 2004

Organizza il Workshop NED-2005 (Nonlinear Economic Models), a URBINO, 28-30 Luglio 2005

Organizza il 4° Workshop MDEF (Modelli Dinamici in Economia e Finanza), a URBINO, Sett. 2006

Organizza il Workshop NET-2007 (Networks: Topology and Dynamics), a URBINO, 17-19 Maggio 2007

Organizza il 5° Workshop MDEF (Modelli Dinamici in Economia e Finanza), a URBINO, Sett. 2008

Organizza l'International Workshop NOMA (Nonlinear Maps and Applications), a URBINO, Sett. 2009

Organizza il Tutorial Workshop DDSA (Discrete Dynamical Systems and Applications), a URBINO, 31 Giugno - 3 Luglio 2010.

Organizza una Special Session on "Nonlinear Maps and Applications" at NOLTA 2010, Krakow, Poland, Sept. 5-8, 2010

Organizza il 6° Workshop MDEF (Modelli Dinamici in Economia e Finanza), a URBINO, Sett. 2010

Organizza il 6° Workshop della SICC (Società Italiana di Caos e Complessità): "NONLINEAR DYNAMICS OF PIECEWISE-SMOOTH DYNAMICAL SYSTEMS", URBINO, 21-23 Sett. 2011

Organizza il 7° Workshop MDEF (Modelli Dinamici in Economia e Finanza), a URBINO, Sett. 2012

Co-organizer with Soumitro Banerjee of the minisymposia "Bifurcations in piecewise smooth and discontinuous maps" at the SIAM International Conference on Applications of Dynamical Systems, Snowbird, USA, May 19-23, 2013

Co-Organizza il 8° Workshop della SICC (Società Italiana di Caos e Complessità): "BIFURCATIONS in PWS SYSTEMS: PERSPECTIVES, METHODOLOGIES and OPEN PROBLEMS", URBINO, 11-13 Sett. 2013

Co-Organizza il 8° Workshop MDEF (Modelli Dinamici in Economia e Finanza), a URBINO, Sett. 2014

Co-organizza la Training School, URBINO, 17-19 Settembre 2015 "Training school on qualitative theory of dynamical systems, tools and applications".

The training school is organized by the ISCH COST ACTION IS1104 project on “The EU in the new complex geography of economic systems: models, tools and policy evaluation” (<http://www.geocomplexity-cost.eu>) and Department of Economics, Society, Politics of Urbino University (Italy)

Co-organizza il 9° International Workshop MDEF (Modelli Dinamici in Economia e Finanza), a URBINO, 23-25 giugno 2016

Co-organizza il 17° International Symposium on Dynamic Games (ISDG-2016) a URBINO, 12-15 luglio 2016. (Organized by the International Society on Dynamic Games and Applications and the Department DESP, Urbino).

Co-organizza il Convegno Internazionale Workshop PODE-17: Progress on Difference Equations, Urbino, 29-30-31 maggio 2017.

Co-organizza il 10° International Workshop MDEF (Modelli Dinamici in Economia e Finanza), a URBINO, 6-8 settembre 2018

PROFESSORI ospitati per COLLABORAZIONI DI RICERCA.

- Prof. C. Mira (INSA-Tolosa-Francia) fine maggio 1991.
- Prof. D. Fournier-Prunaret (INSA-Tolosa-Francia) 20-26 luglio 1992.
- Prof. R. Abraham (Univ. of California- Santa Cruz-USA) 19-22 settembre 1992.
- Prof. Y. Maistrenko e Dott.ssa I. Sushko (Ukrainian Academy of Sciences, Kiev) 14-19 giugno 1993.
- Prof. D. Fournier-Prunaret, 12-17 luglio 1993.
- Prof. R. Abraham, 11-22 ottobre 1993.
- Prof. Y. Maistrenko e Dott.ssa I. Sushko, 6 ottobre - 6 novembre 1994.
- Prof. R. Abraham, 29 gennaio - 7 febbraio 1995.
- Prof. L. Shilnikov, A. Shilnikov, Y. Maistrenko, 4-11 giugno 1995.
- Prof. Helena Nusse, 8-12 giugno 1996.
- Prof. R. Abraham, 9 giugno-8 luglio 1996.
- Prof. Y. Maistrenko (Ukrainian Academy of Sciences, Kiev) mese di marzo 1997.
- Dott.ssa I. Sushko (Ukrainian Academy of Sciences, Kiev) 3-15 marzo 1997.
- Prof Erik Mosekilde (Università di Danimarca, Lyngby) 9-15 marzo 1997.
- Prof. Martin Hasler (Dep. di Electrical Engineering, Losanna) 13-15 marzo 1997.
- Prof. D. Fournier-Prunaret (INSA Tolosa), 19-24 giugno 1997.
- Prof. R. Abraham, 15 -20 settembre 1997.
- Prof. T. Puu (Dep. Of Economics, University of Umea, Svezia) 2-6 aprile 1998.
- Prof. M. Kopel (Univ.of Technology, Dep. of Managerial Economics, Vienna) 23-28 maggio 1998.
- Prof. C. Chiarella (Univ.of Technology, Sydney, Australia) 21-26 maggio 1998.
- Prof. T. Puu (Dep. Of Economics, University of Umea, Svezia) 15-17 Marzo 1999.
- Prof. C. Mira (Tolosa-Francia) 21-26 Ottobre 1999.

- Prof. V. Shalfeev (University of Nizny- Novgorod) 15-18 Dicembre 1999.
- Prof. C. Chiarella (Univ.of Technology, Sydney, Australia) 14-22 maggio 2000.
- Prof. R. Abraham, 15 -20 settembre 2000.
- Dott.ssa I. Sushko (Ukrainian Academy of Sciences, Kiev) 20 Febbraio -20 marzo 2001.
- Prof. T. Puu (Dep. Of Economics, University of Umea, Svezia) 25 Febbraio - 10 Marzo 2001.
- Prof. C. Chiarella (Univ.of Technology, Sydney, Australia) 19-25 giugno 2001.
- Prof. T. Puu (Dep. Of Economics, University of Umea, Svezia) 19-28 Febbraio 2002.
- Dott.ssa I. Sushko (Ukrainian Academy of Sciences, Kiev) 14 Febbraio -15 marzo 2002.
- Prof. C. Chiarella (Univ.of Technology, Sydney, Australia) 2-15 giugno 2002.
- Prof. T. Puu (Dep. Of Economics, University of Umea, Svezia) 13-18 giugno 2002.
- Dott.ssa I. Sushko (Ukrainian Academy of Sciences, Kiev) 7-30 Giugno 2002.
- Prof. T. Puu (Dep. Of Economics, University of Umea, Svezia) 25 sett. 2002 –2 Ott.2002.
- Dott.ssa I. Sushko (Ukrainian Academy of Sciences, Kiev) 23 Sett. 2002 – 15 Ott. 2002.
- Prof. T. Puu (Dep. Of Economics, University of Umea, Svezia) 2-14 Marzo 2003.
- Dott.ssa I. Sushko (Ukrainian Academy of Sciences, Kiev) 1-30 Marzo 2003.
- Dott.ssa I. Sushko (Ukrainian Academy of Sciences, Kiev) 15 Novembre-10 Dicembre 2003.
- Dott.ssa I. Sushko (Ukrainian Academy of Sciences, Kiev) 10 Feb.- 10 Marzo 2004.
- Prof. T. Puu (Dep. Of Economics, University of Umea, Svezia) 27 febbraio-7 Marzo 2004.
- Prof. C. Mira (Tolosa-Francia) 6-14 luglio 2004.
- Dott.ssa I. Sushko (Ukrainian Academy of Sciences, Kiev) Settembre 2004-Settembre 2005.
- Dott. José Carlos Valverde Fajardo (Departamento de Matemáticas, Escuela Politécnica Superior de Albacete, Universidad de Castilla la Mancha, Campus Universitario. Avda. España. 02071-Albacete, SPAIN) 10 Gennaio 2005 – 25 Febbraio 2005.
- Prof. T. Puu (Dep. Of Economics, University of Umea, Svezia) 14-30 Luglio 2005.
- Prof. C. Chiarella (Univ.of Technology, Sydney, Australia) 28 luglio - 6 agosto 2005.

Prof. T. Puu, 2006, 2007, 2009

D. Fournier Prunaret e Pascal Charge: Febbraio 2007, Febbraio 2008,

D. Fournier Prunaret Febbraio 2010

Viktor Avrutin: March 2008, September 2008, March 2009, September 2009

Soumitro Banerjee, Settembre 2009

Prof. Ingrid Kubin, University of Vienna, Austria, June-6 – July 15, 2011

Viktor Avrutin: September 20-30, 2011 and October 13-23, 2011.

Ingegnere Algerino nel 2012 e 2013 (per 3 settimane ?)

Studiante Indiano per un mese, Summer 2014

Viktor Avrutin Marie Curie two years, from Summer 2012 to Autumn 2014

Dott.ssa Roya Makrooni, from Teheran, 6 moths, from November 2014 to april 2015.

Dott.ssa Iryna Sushko three months every year, since 2010 up to 2019

Prof. Ingrid Kubin, University of Vienna, Austria, Mary-20 . June -20 2018

Prof. Víctor Mañosa, Departament de Matemàtiques, Universitat Politècnica de Catalunya (Spain), Feb.5-Feb-10, 2018

Prof. Wirot Tikjha, Pibulsongkram Rajabhat University, Tailandia, Ottobre 22- Dicembre 22, 2018.

Prof. Xavier Jarque, Departament de Matemàtiques i Informàtica, Universitat de Barcelona, 5-9 maggio, 2019

Prof. Zntonio Garijo, Universitat Rovira i Virgili, Tarragona, Spain, 5-9 maggio, 2019

Prof. Víctor Mañosa, Departament de Matemàtiques, Universitat Politècnica de Catalunya (Spain), 15-18 Luglio 2019.

COMUNICAZIONI a CONVEGNI NAZIONALI ed INTERNAZIONALI

- [C1] A. Cerè, L. Gardini "Mathematical modelling of displacement processes of oil by chemical methods", presentato al convegno "Multifunctions and Integrands", Catania, settembre 1983.
- [C2] L. Gardini, H. Sedehi, R. Serra "A reduced model for evaluating the impact of man on the environment", Proceedings of the International Conference of System Dynamics, Vol. I, pp. 274-290 (Keystone, 1985).
- [C3] M. Gallegati, L. Gardini "Un modello Neokeynesiano di equilibrio", presentato al "Convegno di Matematica Applicata all'Economia e all'Ingegneria" (Pescara, gennaio 1989).
- [C4] L. Gardini "Dinamiche complesse in una classe di modelli IS-LM alle differenze, nonlineari, bidimensionali", presentato al XIII Convegno AMASES, (Verona, settembre 1989).
- [C5] D.DelliGatti, M. Gallegati, L. Gardini "Complex dynamics in a simple macroeconomic model with financing constraints" presentato all'International Symposium on Economic Modelling, Urbino, luglio 1990.
- [C6] L. Gardini "On a model of financial crisis. Critical Lines as new tools of global analysis", presentato al convegno "Nonlinear Dynamics in Economics and Social Sciences", Certosa (SI) Maggio 1991.
- [C7] L. Gardini "Global analysis and bifurcations in two-dimensional endomorphisms by use of critical curves", presentato al Convegno "European Conference on Iteration Theory '91", Lisbona (Portogallo, sett. 1991).
- [C8] L. Gardini "Modelli macroeconomici in tempo discreto: sviluppi recenti dei metodi di analisi globale". Presentato al XV Convegno AMASES, Grado, Sett. 1991.
- [C9] L. Gardini, J. C. Cathala e C. Mira "Contact bifurcations of absorbing and chaotic areas in two-dimensional endomorphisms", presentato al Convegno "European Conference on Iteration Theory '92", Batschuns (Austria), Sett. 1992.
- [C10] L. Gardini, C. Mira e D. Fournier-Prunaret "Properties of invariant areas in two-dimensional endomorphisms", presentato al Convegno "European Conference on Iteration Theory '92", Batschuns (Austria), Sett. 1992.
- [C11] L. Gardini "Homoclinic orbits of saddles in two-dimensional endomorphisms", in Iteration Theory", presentato al Convegno "European Conference on Iteration Theory '92", Batschuns (Austria), Sett. 1992
- [C12] C. Mammana e L. Gardini "On invariant chaotic intervals and homoclinic bifurcations", Convegno AMASES, Modena, settembre 1994.
- [C13] D. Fournier-Prunaret, C. Mira, L. Gardini "Some contact bifurcations in two-dimensional examples", presentato all'European Conference on Iteration Theory (ECIT94), Opava (Czech Republic), Settembre 1994.
- [C14] C. Mammana e L. Gardini "Period-Adding and Period-Doubling phenomena", presentato al Convegno AMASES, Settembre 1995.
- [C15] C. Mammana e L. Gardini "Cusp points and critical points in, two-dimensional endomorphisms", presentato al Convegno AMASES, Settembre 1996.

- [C16] L. Gardini, G.I. Bischi, R. Abraham "A bridge. between fold and cusp points and the critical curves LC_1 and LC in two-dimensional endomorphisms", presentato all'European Conference on Iteration Theory (ECIT96), Urbino, Settembre 1996.
- [C17] L. Gardini, G.I. Bischi "Focal points and focal values in rational maps", presentato all'European Conference on Iteration Theory (ECIT96), Urbino, Settembre 1996.
- [C18] G.I. Bischi, L. Gardini "Focal points and basin fractalization in some classes of maps", presentato all'European Conference on Iteration Theory (ECIT96), Urbino, Settembre 1996.
- [C19] I.M. Sushko, Y.L. Maistrenko, L. Gardini "Chaotic attractors at the transition from invertible to noninvertible endomorphisms in a two-dimensional piece-wise linear family", presentato all'European Conference on Iteration Theory (ECIT96), Urbino, Settembre 1996.
- [C20] G.I. Bischi, L. Gardini "Periodic and chaotic behaviour in duopoly games", presentato al 7-th Symposium of the Society of Dynamic Games, Giappone, Dicembre 1996.
- [C21] G.I. Bischi, L. Stefanini, L. Gardini "Synchronization, bubbling and critical curves in a duopoly game", presentato al 15th I.M.A.C.S. World Congress, Berlino, Agosto 1997.
- [C22] G.I. Bischi, L. Gardini "Basin bifurcations in rational maps with a focal point belonging to its set of focal values", presentato al 15th I.M.A.C.S. World Congress, Berlino, Agosto 1997.
- [C23] C. Mammana, G.I. Bischi, L. Gardini "Multistability and cyclical attractors in duopoly games", presentato al Convegno AMASES, Settembre 1997.
- [C24] L. Stefanini, G.I. Bischi, L. Gardini "Synchronization and intermittency in duopoly games", presentato al Convegno AMASES, Settembre 1997.
- [C25] G.I. Bischi, L. Gardini, M. Kopel "Adaptive budgeting decisions in a market with heterogeneous brands" presentato al 3° Workshop on "Economics with Heterogeneous interacting Agents" Ancona, 29-30 Maggio 1998.
- [C26] L. Gardini "Noninvertible maps of the plane and the role of critical curves" comunicazione presentata nella sessione dal titolo "Discrete Dynamics, Chaos and Applications" all'European Conference on Operational Research, Bruxel, 12-15 giugno 1998.
- [C27] G.I. Bischi, L. Gardini, C. Mira "Unbounded sets of attraction in rational maps with vanishing denominators", presentato all'European Conference on Iteration Theory, Muszyna-Zlockie, Polonia, 30/9-5/15 1998.
- [C28] L. Gardini, G.I. Bischi, C. Mira "New phenomena related to maps with vanishing denominators", presentato all'European Conference on Iteration Theory, Muszyna-Zlockie, Polonia, 30/9-5/15 1998.
- [C29] D. Fournier-Prunaret, L. Gardini, G.I. Bischi "Characterization of basin boundaries in Bairstow's iterative methods", presentato all'European Conference on Iteration Theory, Muszyna-Zlockie, Polonia, 30/9-5/15 1998.
- [C30] A. Agliari, L. Gardini, D. Delli Gatti, M. Gallegati "Global dynamics in a nonlinear model for the equity ratio" presentato al Convegno AMASES, Genova, 9-12 settembre 1998.
- [C31] G.I. Bischi, L. Gardini, C. Mira "Unbounded caotic sets in rational maps with vanishing denominator", Presentato all'International Symposium on Nonlinear Theory and its Application, Crans-Montana, Svizzera, 14-17 Settembre 1998.
- [C32] A. Agliari, L. Gardini "The nonlinear oligopoly. A case with three producers", Presentato a Bologna, Workshop sui Giochi Dinamici (3-4 giugno 1999).
- [C33] C. Chiarella, R. Dieci, L. Gardini "Asset price dynamics in a financial market with fundamentalists and chartists", Presentato al Convegno WEHIA, Genova 3-4 giugno 1999
- [C34] R. Dieci, G.I. Bischi, L. Gardini "On triangular maps describing a Kaldor-type business cycle model", Convegno AMASES, Sett. 1999.

- [C35] A. Agliari, L. Gardini, T. Puu "The dynamics of an oligopoly with three producers", Convegno AMASES, Sett. 1999.
- [C36] G.I. Bischi, L. Gardini "Noninvertible maps and complex basin boundaries", Conference SICC, Verbania (1 ottobre 1999).
- [C37] R. Dieci, L. Gardini "Global dynamics in a Kaldor-type business cycle model", Conference SICC, Verbania (1 ottobre 1999).
- [C38] C. Chiarella, R. Dieci, L. Gardini "Speculative behaviour and complex asset price dynamics", Workshop on expectational and learning dynamics in financial markets, Sydney, 13-14 Dicembre 1999
- [C39] G.I. Bischi, L. Gardini "Equilibrium selection and transient dynamics under adaptive and statistical learning", CENDEF Workshop on Economic Dynamics, Amsterdam, 13-15 Gennaio 2000.
- [C40] C. Chiarella, R. Dieci, L. Gardini "Asset price dynamics in a financial market with fundamentalists and chartists", Second International Conference on Discrete Chaotic Dynamics in Nature and Society, Southern, Odense, Danimarca, 9-13 Maggio 2000.
- [C41] R. Dieci, G.I. Bischi, L. Gardini "Multiple attractors and global bifurcations in a Kaldor-type business cycle model", Seventh Viennese Workshop on Optimal Control, Dynamic Games and Nonlinear Analysis, Vienna, 24-26 Maggio 2000.
- [C42] F. Bizzarri, M. Storace, R. Lupini, L. Gardini "Bifurcation analysis of a hysteretic chaotic circuit", NOLTA (Nonlinear Theory and its Applications) Sett. 2000
- [C43] L. Gardini "Noninvertible maps and their applications" WCNA, Catania, July 2000
- [C44] C. Mira, G.I. Bischi, L. Gardini "Survey on maps with a vanishing denominator", WCNA, Catania, July 2000.
- [C45] M. Ciaschini, R. Dieci, L. Gardini, "Global dynamics in a multi sector model with non constant return to scale", Input-Output International Conference, Macerata, agosto 2000.
- [C46] A. Agliari, L. Gardini, C. Mira "On the fractal structure of basin boundaries in two-dimensional noninvertible maps", ECIT2000, Spagna, Settembre 2000
- [C47] L. Gardini, G.I. Bischi, C. Mira "Invariant curves and focal points in a Luness iterative process", ECIT2000, Spagna, Settembre 2000
- [C48] I. Foroni, L. Gardini "Aspettative adattive e statistiche in un mercato di risorse rinnovabili", AMASES, Sett. 2000
- [C49] M. Ciaschini, R. Dieci, L. Gardini "A multi-sector dynamic model with nonlinear investment demand and scale-dependent input requirements", AMASES, Sett. 2000.
- [C50] I. Foroni, L. Gardini "Heterogeneous models with learning", Workshop MDEF (Modelli Dinamici in Economia e Finanza), Sett. 2000.
- [C51] A. Agliari, L. Gardini, T. Puu "Complex dynamics in a nonlinear Cournot triopoly game", Workshop MDEF (Modelli Dinamici in Economia e Finanza), Sett. 2000.
- [C52] R. Dieci, L. Gardini, C. Chiarella "Global dynamics and bifurcations in a simple asset pricing model", Workshop MDEF (Modelli Dinamici in Economia e Finanza), Sett. 2000.
- [C53] G.I. Bischi, L. Gardini "Fenomeni di sincronizzazione del caos e bacini "riddled" in modelli simmetrici di duopolio", Montecatini, Novembre 2000.
- [C54] R. Dieci, G.I. Bischi, L. Gardini "Bifurcation routes leading to multistability in a business-cycle model" CENDEF, Amsterdam, Olanda, Gennaio 2001.
- [C55] A. Agliari, G.I. Bischi and L. Gardini "Some methods for the global analysis of dynamic games represented by noninvertible maps" Conference "Oligopoly and Complex Dynamics: Tools & Models" Umea, Svezia, Giugno 2001.

- [C56] L. Gardini, T. Puu and I. Shushko: "Cournot duopoly with kinked linear demand, according to Palander and Wald", Conference "Oligopoly and Complex Dynamics: Tools & Models", Umea, Svezia Giugno 2001.
- [C57] T. Puu and L. Gardini "Equilibrium and Dynamics in Bertrand-Hotelling duopoly games" Conference "Oligopoly and Complex Dynamics: Tools & Models", Umea, Svezia Giugno 2001.
- [C58] Ilaria Foroni e Laura Gardini, "Heterogeneous Models with Learning and Homoclinic Bifurcations, Convegno WHEIA, Maastricht, Giugno 2001.
- [C59] A. Agliari, L. Gardini e T. Puu "Global Bifurcations in a Three dimensional Cournot Oligopoly, Congress on Game Theory, XIV IMGTA, Ischia, Luglio 2001.
- [C60] L. Gardini, T. Puu e I. Sushko "Cournot Duopoly with Kinked Linear Demand According to Palander and Wald", Congress on Game Theory, XIV IMGTA, Ischia, Luglio 2001.
- [C61] R. Dieci, C. Chiarella e L. Gardini, "*Asset price dynamics in a financial market with fundamentalists and chartists*" Relazione su invito all' Asia Pacific Finance Association (APFA) Conference, Bangkok, 22-25 luglio 2001.
- [C62] Ilaria Foroni e Laura Gardini, "Heterogeneous Models with Learning and Homoclinic Bifurcations", Atti Amases 2001, Firenze, Settembre 2001.
- [C63] G.I. Bischi, L. Gardini, R. Leombruni, A. Palestini, M. Gallegati "Mean fields effects and interaction cycles in financial markets", presented at "Tenth Annual Meeting of the Society for Nonlinear Dynamics and Econometrics", Atlanta, March 14-15, 2002.
- [C64] C. Chiarella, R. Dieci, L. Gardini "The interaction of speculation and diversification", presented at "Tenth Annual Meeting of the Society for Nonlinear Dynamics and Econometrics", Atlanta, March 14-15, 2002.
- [C65] F. Bizzarri, L. Gardini, R. Lupini, M. Storace: "Bifurcation analysis of a 3D piecewise linear continuous flow through a 1D discontinuous map", School-Workshop "Bifurcation in Nonsmooth Dynamical Systems", Milano, 22-23 Aprile 2002.
- [C66] Laura Gardini, organizza una invited section alla Conferenza SIMAI, dove presenta la comunicazione "Iterated Noninvertible Maps as Discrete Dynamical Systems", Chia Laguna, Sardegna, Maggio 2002.
- [C67] Carl Chiarella, Roberto Dieci, Laura Gardini "A dynamic analysis of speculation across two markets", International Conference WHEIA, Trieste, Maggio 2002.
- [C68] Roberto Dieci, Carl Chiarella, Laura Gardini "Price dynamics and diversification under heterogeneous expectations", conference on Computation in Economics and Finance, Aix-en-Provence - June 2002.
- [C69] Ilaria Foroni, Laura Gardini "Global dynamics in a class of heterogeneous Cobweb models", conference on Computation in Economics and Finance, Aix-en-Provence - June 2002.
- [C70] I. Sushko, L. Gardini, T. Puu: "Business Cycles in two regions linked by interregional trade: the Hicksian Floor-roof model revisited", Odense, Denmark, August 2002.
- [C71] Ilaria Foroni, Laura Gardini "Adaptive Market Models between fundamentalists and agents with fading memory", AMASES, Settembre 2002, Verona.
- [C72] Ilaria Foroni, Laura Gardini, J. Barkley Rosser Jr. "Adaptive and statistical expectations in a renewable resource market ", International Conference "Discrete Chaotic Dynamics in Nature and Society", Tokyo, Sept. 9-13, 2002, e MDEF (Modelli Dinamici in Economia e Finanza), Urbino, settembre 2002.
- [C73] L. Gardini, I. Foroni, C. Mira "On the particular foliation associated with some families of two-dimensional maps of the plane", ECIT (European Conference on Iteration Theory), 2002, Evora (Portogallo), Grazer Mathematische Berichte N.346, 2004, pp. 137-156.
- [C74] A. Agliari, L. Gardini, C. Mira "Transition from smooth to fractal boundaries in two-dimensional endomorphisms ", ECIT (European Conference on Iteration Theory), 2002, Evora (Portogallo), Grazer Mathematische Berichte N.346, 2004, pp. 1-18.

- [C75] C. Mira, L. Gardini, G.I. Bischi "Bifurcation of fractalization in a two-dimensional Z_1 - Z_3 - Z_1 cubic map", ECIT (European Conference on Iteration Theory), 2002, Evora (Portogallo), Grazer Mathematische Berichte N.346, 2004, pp. 299-312.
- [C76] A. Agliari, C. Chiarella, L. Gardini "Adaptive expectation mechanisms in models of monetary dynamics", MDEF (Modelli Dinamici in Economia e Finanza), Urbino, settembre 2002.
- [C77] I. Sushko, T. Puu, L. Gardini "The Hicksian floor-roof model revisited", MDEF (Modelli Dinamici in Economia e Finanza), Urbino, settembre 2002.
- [C78] C. Chiarella, R. Dieci, L. Gardini "A model of asset price dynamics and diversification with heterogeneous agents", MDEF (Modelli Dinamici in Economia e Finanza), Urbino, settembre 2002.
- [C79] G.I. Bischi, M. Gallegati, L. Gardini, R. Leonbruni, A. Palestini "Mean field and interaction cycles in financial markets", MDEF (Modelli Dinamici in Economia e Finanza), Urbino, settembre 2002.
- [C80] Laura Gardini: "Cyclical behaviours in Hicks models", Workshop "Endogenous approaches to business cycles", Urbino 11 Marzo 2003.
- [C81] R. Dieci, Carl Chiarella, Laura Gardini: "A model of asset price and wealth dynamics with heterogeneous agents", conference on Computation in Economics and Finance, Firenze, Marzo 2003.
- [C82] G.I. Bischi L. Gardini, M. Gallegati, R. Leonbruni e A. Palestini "Herd Behavior and Price Fluctuations in Financial Markets: an unidirectionally coupled dynamical system", Eighth Viennese Workshop on Optimal Control, Dynamic Games and Nonlinear Dynamics, Vienna, May 14-16, 2003.
- [C83] R. Dieci, Carl Chiarella, Laura Gardini: "Asset price and wealth dynamics in a financial market with heterogeneous agents", Workshop on Optimal Control, Dynamic Games and Nonlinear Analysis, Vienna, Maggio 2003.
- [C84] R. Dieci, Carl Chiarella, Laura Gardini: "A model of asset price dynamics and diversification with heterogeneous agents", WHEIA, Kiel, 29-31 Maggio, 2003.
- [C85] A. Agliari, T. Puu, L. Gardini: "Global bifurcations in a duopoly model with adaptive adjustment process", XV Italian Meeting on Game Theory and Applications, Urbino, Luglio 2003.
- [C86] I. Sushko, L. Gardini, T. Puu: "Duopoly with piecewise linear discontinuous reaction functions", XV Italian Meeting on Game Theory and Applications, Urbino, Luglio 2003.
- [C87] A. Agliari, C. Chiarella, L. Gardini "Analysis of a discrete model of monetary dynamics under perfect foresight hypothesis" AMASES 2003.
- [C88] C. Chiarella, R. Dieci, L. Gardini "Asset price dynamics and diversification with heterogeneous agents" AMASES 2003.
- [C89] Tõnu Puu, I. Sushko and L. Gardini "A Hicksian Multiplier-Accelerator Model with Floor Determined by Capital Stock" Workshop on Nonlinear Dynamics in Economics, Trieste, 5-6 Giugno 2004.
- [C90] I. Sushko, L. Gardini and Tõnu Puu "Tongues of Periodicity in a Family of Two-Dimensional Discontinuous Maps of Real Mobius Type " Workshop on Nonlinear Dynamics in Economics, Trieste, 5-6 Giugno 2004.
- [C91] Anna Agliari, C. Chiarella and L. Gardini "The Adaptive Expectations Mechanisms in the Framework of Nonlinear Monetary Dynamics" Workshop on Nonlinear Dynamics in Economics, Trieste, 5-6 Giugno 2004.
- [C92] Roberto Dieci, C. Chiarella and L. Gardini "Heterogeneous Beliefs, Diversification and Dynamics of Asset Prices " Workshop on Nonlinear Dynamics in Economics, Trieste, 5-6 Giugno 2004.
- [C93] G.I. Bischi, L. Gardini, R. Leonbruni, A. Palestini and M. Gallegati " Herding Behaviours and Non-Fundamental High Frequency Asset Price Fluctuations in Financial Markets " Workshop on Nonlinear Dynamics in Economics, Trieste, 5-6 Giugno 2004.
- [C94] A. Agliari, R. Dieci, L. Gardini, "Homoclinic loops in Kaldor like business cycle models", NED-2004 (Nonlinear Economic Dynamics), Tokyo, luglio 2004.

- [C95] C. Chiarella, R. Dieci, L. Gardini, "Asset price and wealth dynamics in a financial market with heterogeneous agents", 10th International Conference on Computing in Economics and Finance, Amsterdam, July 8-10, 2004.
- [C96] I. Sushko, L. Gardini, T. Puu: "Hicksian Floor-Roof Model for Two Regions Linked by Interregional Trade", NED-2004 (Nonlinear Economic Dynamics), Tokyo, luglio 2004.
- [C97] A. Agliari, R. Dieci, G.I. Bischi, L. Gardini "Homoclinic tangles associated with closed invariant curves in families of 2D maps", presentato al Convegno "European Conference on Iteration Theory 2004", Batschuns (Austria), Sett. 2004.
- [C98] A. Agliari, L. Gardini "Subcritical Neimark-Hopf and Global bifurcations ", presentato al Convegno "European Conference on Iteration Theory 2004", Batschuns (Austria), Sett. 2004.
- [C99] A. Agliari, R. Dieci, L. Gardini "Multistability and homoclinic tangles in a Kaldor-like business cycle model", AMASES, Modena, Sett. 2004.
- [C100] Roberto Dieci, C. Chiarella and L. Gardini: "Asset price and wealth dynamics under heterogeneous beliefs", MDEF Settembre 2004, Urbino.
- [C101] Anna Agliari, L. Gardini e T. Puu: "Homoclinic connections in duopoly models", MDEF Settembre 2004, Urbino.
- [C102] Iryna Sushko, A. Agliari e L. Gardini "Global bifurcations in a family of piecewise smooth unimodal maps ", MDEF Settembre 2004, Urbino.
- [C103] Tõnu Puu, I. Sushko e L. Gardini "On the change of periodicities in the Hicksian multiplier-accelerator model with a consumption floor", MDEF Settembre 2004, Urbino.
- [C104] Ilaria Foroni, Laura Gardini, Tony He, Roberto Dieci, "Heterogeneous financial market model with switching and fixed fractions of agents", MDEF, 16-18 Settembre 2004, Urbino.
- [C105] I. Sushko, A. Agliari and L. Gardini "Bistability and border collision bifurcations for a family of unimodal piecewise smooth maps", presentato al Workshop "Bifurcations in Nonsmooth and Hybrid Dynamical Systems", Milano 21-22 ottobre, 2004.
- [C106] L. Gardini "Global bifurcations of invariant curves in duopoly games", presentato al "Seminario Itinerante", Dipartimento di Matematica, Università di Genova, 14 Marzo 2005.
- [C107] F. Bizzarri, L. Carezzano, M. Storace, L. Gardini "Bifurcation analysis of a circuit related piecewise affine map", presentato a ISCAS 2005, Kobe, Japan, 24-26 May 2005.
- [C108] I. Sushko, L. Gardini, A. Agliari: "Border-Collision Bifurcation Curves", University of Bristol, Dept. of Engineering Mathematics (Bristol, UK, Feb. 14-21, 2005).
- [C109] I. Sushko and L. Gardini: "Center-like Bifurcation for 2Dim Piecewise Linear Maps", International Workshop "Complexity and Randomness in Economic Dynamical Systems", Bielefeld Graduate School of Economics and Management, University of Bielefeld, Germany, Mar. 17-19, 2005.
- [C110] L. Gardini: "Global bifurcations of closed invariant curves", University of Bologna, Dept. of Mathematics, Aprile 2005.
- [C111] L. Gardini: "Global bifurcations in Business Cycles Models ", University of Piacenza, Dept. of Economics, May 6, 2005.
- [C112] I. Sushko, L. Gardini: "Center Bifurcations", International Conference "Keynesian Macrodynamics - the Multiplier-Accelerator Model Revisited", University of Umeå, Sweden (June 10-11, 2005) .
- [C113] I. Sushko, L. Gardini, T. Puu: "Hicksian Business Cycle Model with Smooth and Piecewise Linear Investment Function" International Conference "Keynesian Macrodynamics - the Multiplier-Accelerator Model Revisited", University of Umeå, Sweden (June 10-11, 2005) .
- [C114] A. Agliari, G.I. Bischi and L. Gardini: "Some Methods for the Global Analysis of Business Cycle Models in Discrete Time" International Conference "Keynesian Macrodynamics - the Multiplier-Accelerator Model Revisited", University of Umeå, Sweden (June 10-11, 2005) .
- [C115] L. Gardini "Global bifurcations of invariant curves in two dimensional maps ", 2nd International Workshop "Functional Analysis Methods in Economics and Finance", University of Calabria, Cetraro, Cosenza, Italy (July 7-9, 2005).
- [C116] I. Sushko, L. Gardini, G.I. Bischi: "Border-collision bifurcation in Duopoly Model with Capacity Limits", International Conference on Nonlinear Economic Dynamics, University of Urbino, Italy (July 28-30, 2005).
- [C117] A. Agliari, C. Chiarella, L. Gardini: "Adaptive Expectation Mechanisms in Nonlinear Monetary Dynamics: Multistability and Global Bifurcations", XXIX Convegno AMASES. Palermo 12-15

settembre 2005.

- [C118] R. Dieci, Ilaria Foroni, Laura Gardini, Tony He: "Market mood, adaptive beliefs and asset price dynamics", XXIX Convegno AMASES. Palermo 12-15 settembre 2005.
- [C119] C. Chiarella, R. Dieci, Laura Gardini, L. Sbragia: "State-dependent beliefs and confidence in a financial market model with rational fundamentalists and trend chasers", Aix En Provence, Francia, 2006.
- [C120] C. Chiarella, R. Dieci, Laura Gardini, L. Sbragia: "A model of financial market dynamic with state dependent beliefs and confidence", WHEIA, Bologna, 15-18 giugno 2006.
- [C121] I. Sushko, L. Gardini: "Center Bifurcation for a two-dimensional piecewise linear map", ECIT, Milano, Settembre 2006.
- [C122] Laura Gardini e C. Mira: "From the box-within-a-box bifurcation structure to the Julia set", ECIT, Milano, Settembre 2006.
- [C123] C. Chiarella, R. Dieci, Laura Gardini, L. Sbragia: "Time varying confidence in a simple asset pricing model with heterogeneous agents", MDEF, Urbino, 21-23 Settembre 2006.
- [C124] F. Tramontana and L. Gardini "On one-dimensional backward looking models in Economics", MDEF, Urbino, 21-23 Settembre 2006.
- [C125] F. Tramontana and L. Gardini "On non uniquely defined forward looking models", AMASES, Lecce, 2-6 settembre 2007.
- [C126] F. Tramontana, T. Puu and L. Gardini "Duopoly games with alternative technologies", AMASES, Lecce 2-6 settembre 2007.
- [C127] L. Gardini, A. Naimzada and I. Sushko, "Growing through chaotic intervals" AMASES, Lecce 2-6 settembre 2007.
- [C128] L. Gardini, F. Tramontana "On non-uniquely defined forward looking models", NOMA-2007 (Workshop on Noninvertible Maps and Applications), Tolosa, 13-14 December 2007.
- [C129] T. Puu, L. Gardini, F. Tramontana "Duopoly games with alternative technologies", NOMA-2007 (Workshop on Noninvertible Maps and Applications), Tolosa, 13-14 December 2007.
- [C130] L. Gardini, I. Sushko, T. Puu: "Regular and Chaotic growth in a Hicksian floor/ceiling model", workshop on "Transdisciplinary Perspectives on Economic Complexity", James Madison University, Harrisonburg, Virginia, 17 May, 2008.
- [C131] F. Tramontana, L. Gardini, R. Dieci, F. Westerhof "The emergence of "bull and bear" dynamics in a nonlinear 3D model of interacting markets", ESHIA-WHEIA, Varsavia, June 19-21, 2008.
- [C132] F. Tramontana, L. Gardini, C. Hommes and R. de Vilder "Sunspot equilibria in an implicitly defined overlapping generation model" workshop "The relevance of networks and complex systems theory for technological search and diffusion", Rimini, June 13-14, 2008.
- [C133] D. Fournier, P. Charge, L. Gardini "Bifurcations in a 2D piecewise-smooth map modelling a switching circuit", DIFF-2008 Suzdal, Russia, June 2008.
- [C134] D. Fournier, P. Charge, L. Gardini "Two-dimensional piecewise defined maps realized with a simple switching circuit", NOLTA-2008 June 2008.
- [C135] L. Gardini, F. Tramontana: "Bubbles and crashes in a financial market with heterogeneous speculators", Workshop on Risk Measurement and Control, Roma, Luglio 2008.
- [C136] L. Gardini, F. Tramontana "Bifurcation curves in discontinuous maps", ECIT 2008, Crimea Sett. 2008.
- [C137] L. Gardini, F. Tramontana "Iterated function systems in backward models", ECIT 2008, Crimea Sett. 2008.
- [C138] L. Gardini, V. Avrutin, M. Schanz "Bifurcations on the Poincaré Equator in the 2D piecewise linear canonical form", ECIT 2008, Crimea Sett. 2008.
- [C139] I. Sushko, L. Gardini "An analogue of the center bifurcation at infinity", ECIT 2008, Crimea Sett. 2008.
- [C140] F. Tramontana, L. Gardini "Discontinuous maps in a duopoly model with capacity limit plants", MDEF, Urbino, Italy, Sept. 25-27, 2008.
- [C141] U. Merlone, L. Gardini, G.I. Bischi "Discontinuous dynamics in binary choice models with social influence", MDEF, Urbino, Italy, Sept. 25-27, 2008.
- [C142] I. Sushko, L. Gardini, A. Naimzada "Growing through chaotic intervals", MDEF, Urbino, Italy, Sept. 25-27, 2008.

- [C143] F. Tramontana, L. Gardini, R. Dieci, F. Westerhof "The emergence of "bull and bear" dynamics in a nonlinear 3D model of interacting markets" MDEF, Urbino, Italy, Sept. 25-27, 2008.
- [C144] L. Gardini, Invited talk "Introduction to Discrete Dynamical Systems" at the Tutorial Workshop "Nonlinear Dynamics in Economic Models", at CIFREM (Interdepartmental Centre for Research Training in Economics and Management), Trento, March 12-13, 2009.
- [C145] L. Gardini, Invited talk "Noninvertible Maps" at "The 6th International Conference on Nonlinear Economic Dynamics" 31 May-2 June 2009, Jönköping University, Sweden.
- [C146] F. Tramontana, F. Westerhof and L. Gardini, "A financial model with heterogeneous agents", "The 6th International Conference on Nonlinear Economic Dynamics" 31 May-2 June 2009, Jönköping University, Sweden.
- [C147] I. Sushko and L. Gardini "Center bifurcation of a point on the Poincaré equator" at "The 6th International Conference on Nonlinear Economic Dynamics" 31 May-2 June 2009, Jönköping University, Sweden.
- [C 148] Iryna Sushko and Laura Gardini "Degenerate bifurcations in one- and two-dimensional piecewise smooth maps", Nonlinear Maps and Applications, NOMA-2009, Urbino Sept. 11-12, 2009.
- [C 149] Laura Gardini, Fabio Tramontana, Viktor Avrutin, Michael Schanz "Improvement of the Leonov approach for border collision bifurcation curves", NOMA-2009, Urbino Sept. 11-12, 2009.
- [C 150] Fabio Tramontana, Laura Gardini "Border Collision Bifurcations in 1D PWL map with one discontinuity and negative jump. Use of the first return map.", NOMA-2009, Urbino Sept. 11-12, 2009.
- [C 151] Viktor Avrutin, Michael Schanz, Laura Gardini "Calculation of bifurcation curves by map replacement", , NOMA-2009, Urbino Sept. 11-12, 2009.
- [C 152] Ugo Merlone, Gian-Italo Bischi, Laura Gardini "Periodic cycles and bifurcation curves for one-dimensional maps describing binary choices in Groups", , NOMA-2009, Urbino Sept. 11-12, 2009.
- [C 153] Gian-Italo Bischi, Laura Gardini, Ugo Merlone "Contact bifurcations, periodic cycles and non connected basins for one-dimensional maps with two discontinuities", , NOMA-2009, Urbino Sept. 11-12, 2009.
- [C 154] Pascal Chargé, Danièle Fournier, Laura Gardini "Bifurcations in a two-dimensional piecewise smooth map, modelling a switching circuit", , NOMA-2009, Urbino Sept. 11-12, 2009.
- [C 155] L. Gardini, F. Tramontana, Xue-Zhong He, F. Westerhoff: "On the complicated price dynamics of simple one- and two-dimensional discontinuous financial markets with heterogeneous interacting traders",
Workshop "Evolution and market Behavior in Economics and Finance" Pisa, Scuola Superiore Sant'Anna, Oct. 2-3 2009.
- [C 156] L. Gardini, F. Tramontana and T. Puu "New properties of the Cournot duopoly with isoelastic demand and constant unit costs", 11th Workshop on Optimal Control, Dynamic Games and Nonlinear Dynamics", Amsterdam, May-31-June 2, 2010.
- [C 157] F. Tramontana, L. Gardini and T. He "Replication of some stylized facts in a simple financial market model with heterogeneous interacting", 11th Workshop on Optimal Control, Dynamic Games and Nonlinear Dynamics", Amsterdam, May 31-June 2, 2010.
- [C 158] D. Fournier Prunaret, L. Gardini and P. Chargé "Border Collision Bifurcations in a Simple Switching Circuit" NOLTA, Poland, September 8-10, 2010.
- [C 159] F. Tramontana, L. Gardini, T. Puu "New properties of the Cournot duopoly", AMASES, Macerata, 1-4 settembre, 2010.
- [C 160] F. Tramontana, L. Gardini, T. He and F. Westerhof "On the complicated price dynamics of simple financial markets with heterogeneous interacting traders", AMASES, Macerata, 1-4 settembre, 2010.
- [C 161] L. Gardini, V. Avrutin, M. Schanz "Organizing centers in parameter space of discontinuous 1D maps with one increasing and one decreasing branch", ECIT 2010, Nant, Francia, September 13-17, 2010.
- [C 162] V. Avrutin, M. Schanz, L. Gardini, I. Sushko "1D maps with one discontinuity. Is $BC \times BC = BBB$ true?",
ECIT 2010, Nant, Francia, September 13-17, 2010.
- [C 163] F. Tramontana, L. Gardini "BCB in a map with two discontinuities", ECIT 2010, Nant, Francia, September 13-17, 2010.

- [C 164] I. Sushko, L. Gardini "Center bifurcation in the Lozi map", ECIT 2010, Nant, Francia, September 13-17, 2010.
- [C 165] L. Gardini, I. Sushko "Doubling bifurcation of a closed invariant curve in 3D maps", ECIT 2010, Nant, Francia, September 13-17, 2010.
- [C 166] L. Gardini, F. Tramontana, Ugo Merlone "Inertia in binary choices: border collision bifurcations and big bang points", MDEF 2010, September 23-25, Urbino, Italy.
- [C 167] Fabio Tramontana, T. He and L. Gardini "A small scale model reproducing volatility clustering in financial markets", MDEF 2010, September 23-25, Urbino, Italy.
- [C 168] Arianna Dal Forno, U. Merlone and L. Gardini "Social influence in ternary choices", MDEF 2010, September 23-25, Urbino, Italy.
- [C 169] G.I. Bischi, L. Gardini "Contact bifurcations of invariant absorbing sets in noninvertible maps", SIAM Conference on Applications of Dynamical Systems, invited talk at the Minisymposium on "The Role of Invariant Manifolds in Global Bifurcations". Snowbird, USA May 22-26, 2011.
- [C 170] I. Sushko, L. Gardini, A. Naimzada "Cycles and Chaotic Attractors in an Infinitely Lived Agent Economy", The Nonlinear Economic Dynamics 2011 Conference (NED11), Cartagena (Spain) June 1-3, 2011.
- [C 171] F. Tramontana, F. Westerhoff, L. Gardini "A simple financial market model with chartists and fundamentalists: market entry levels and discontinuities", The Nonlinear Economic Dynamics 2011 Conference (NED11), Cartagena (Spain) June 1-3, 2011.
- [C 172] V. Avrutin, M. Schanz, L. Gardini, I. Sushko "Intersection of Border Collision Bifurcation Curves as Big Bang Bifurcation Points", ENOC, Roma 25-29 luglio 2011.
- [C 173] F. Tramontana, L. Gardini, V. Avrutin, M. Schanz "Adding Phenomena in Piecewise Linear Maps with Two Discontinuities", ENOC, Roma 25-29 luglio 2011.
- [C 174] I. Sushko and L. Gardini "Degenerate bifurcations in one- and two-dimensional piecewise smooth maps", NOMA, Evora, Portugal, September 15-16, 2011
- [C 175] V. Avrutin, L. Gardini, I. Sushko "On cyclic and acyclic chaotic attractors", NOMA, Evora, Portugal, September 15-16, 2011
- [C 176] L. Gardini, I. Sushko, V. Avrutin, M. Schanz "Critical homoclinic orbits lead to Snap-Back Repellers", NOMA, Evora, Portugal, September 15-16, 2011.
- [C 177] L. Gardini, V. Avrutin and I. Sushko, "Codimension.2 border collision bifurcations in Lorenz Maps", European Conference on Iteration Theory 2012", Ponta Delgada, Azzorre, Portogallo.
- [C 178] V. Avrutin, L. Gardini and I. Sushko, "Map replacement technique", European Conference on Iteration Theory 2012", Ponta Delgada, Azzorre, Portogallo.
- [C 179] L. Gardini and I. Sushko, "Bifurcation structure in a piecewise smooth map with two kink points", European Conference on Iteration Theory 2012", Ponta Delgada, Azzorre, Portogallo.
- [C 180] F. Tramontana, L. Gardini and F. Westerhoff "Stylized facts of financial markets in HAM models with market entry levels" Workshop MDEF (Modelli Dinamici in Economia e Finanza), 21-23 Sett. 2012, Urbino.
- [C 181] I. Kubin and L. Gardini "On the significance of borders", Workshop MDEF (Modelli Dinamici in Economia e Finanza), 21-23 Sett. 2012, Urbino.
- [C 182] K. Matsuyama, I. Sushko and L. Gardini "A Piece-wise Linear Model of Credit Traps and Credit Cycles: A Complete Characterization" Workshop MDEF (Modelli Dinamici in Economia e Finanza), 21-23 Sett. 2012, Urbino.
- [C 183] Iryna Sushko, Viktor Avrutin, Laura Gardini "Bifurcation structure in piecewise smooth maps with two kink points", SIAM International Conference on Applications of Dynamical Systems, Snowbird, USA, May 19-23, 2013.

- [C 184] Viktor Avrutin, Laura Gardini, Iryna Sushko "Homoclinic bifurcations leading to merging and expansion of chaotic attractors", SIAM International Conference on Applications of Dynamical Systems, Snowbird, USA, May 19-23, 2013.
- [C 185] L. Gardini, V. Avrutin, I. Sushko "Codimension two BCB in Piecewise smooth maps", SIAM International Conference on Applications of Dynamical Systems, Snowbird, USA, May 19-23, 2013.
- [C 186] Fabio Tramontana, Frank Westerhoff and Laura Gardini "A simple financial market model with chartists and fundamentalists: market entry levels and discontinuities" NED Siena Luglio 2013
- [C 187] K. Matsuyama, I. Sushko and L. Gardini "Superstable credit cycles" NED Siena Luglio 2013
- [C 188] Viktor Avrutin, Laura Gardini, Iryna Sushko "Piecewise monotone 1D maps and codimension two Border Collision Bifurcations", SICC Tutorial Workshop, Urbino, September 2013
- [C 189] Iryna Sushko, Laura Gardini "Bifurcation phenomena in 2D BCB normal form and Smale horseshoe construction", SICC Tutorial Workshop, Urbino, September 2013
- [C 190] Fabio Tramontana, Laura Gardini, Frank Westerhoff "Border Collision Bifurcations in PWL 1D maps with two discontinuity points", SICC Tutorial Workshop, Urbino, September 2013
- [C 191] V. Avrutin (speaker), Zh.T. Zhusubaliyev, E. Mosekilde, L. Gardini, "Transition to chaos via irregular sequences of border collision bifurcations in a single-phase power electronic inverter", presented at:
- 13th Experimental Chaos and Complexity Conference, Aberdeen, UK, August 24 – 28, 2014
 - IEEE International Meeting on Analysis and Applications of Nonsmooth Systems, Como, Italy, September 10-12, 2014.
 - International Symposium on Nonlinear Theory and its Applications (NOLTA2014), Luzern, Switzerland, September 14-18, 2014
- [C 192] Davide Radi and L. Gardini: A Schelling-like Segregation Model with Heterogeneous Distributions of Tolerance and Entry Restrictions. International Workshop MDEF 2014. Urbino (Italy) September 18-20, 2014
- [C 193] Kiminori Matsuyama, I. Sushko and L. Gardini: Globalization and Synchronization of Innovation Cycles. International Workshop MDEF 2014. Urbino (Italy) September 18-20, 2014
- [C 194] R. Makrooni, N. Abbasi, M. Pourbarat, L. Gardini; "One-dimensional Baker-like map with infinitely many branches", 12th Seminar on Differential Equation and Dynamical System, 27-29 May 2015, Tabriz, Iran.
- [C 195] R. Makrooni, F. Khellat, L. Gardini; "Smooth and nonsmooth bifurcations in a chaotic map", 12th Seminar on Differential Equation and Dynamical System, 27-29 May 2015, Tabriz, Iran.
- [C 196] R. Makrooni, F. Khellat, L. Gardini; "Divergence and bounded chaotic sets in a piecewise smooth family", 12th Seminar on Differential Equation and Dynamical System, 27-29 May 2015, Tabriz, Iran.

Invited Plenary talk:

- [C 197] L. Gardini, R. Makrooni "Border Collision and Fold Bifurcations in a Family of Linear-Hyperbolic Discontinuous Maps", International Conference Nonlinear Maps and Applications (NOMA) June 15-17, 2015, Dublin, Ireland.

[C 198] L. Gardini, I. Sushko and K. Matsuyama "A simplified model of Credit cycles with Good and Bad Projects, and bifurcations" Workshop AMASES, Padova, 10-12 settembre 2015.

Invited Plenary talk:

[C 199] K. Matsuyama, I. Sushko and L. Gardini "Synchronozation of Innovation Cycles", Workshop AMASES, Padova, 10-12 settembre 2015.

Invited Plenary talk:

[C 200] D. Radi, L. Gardini, V. Avrutin "The effects of heterogeneous tolerances and entry restrictions in Schelling's models of segregation: New evidences from nonlinear dynamics." Workshop Social Change as a Complex Dynamical System, December 9-12, 2015, Uppsala University, Svezia.

[C 201] I. Sushko and L. Gardini "2D Border collision normal form and Smale horseshoe construction" ADVANCES IN NONSMOOTH DYNAMICS, CRM (Barcelona, Spain) February 1-5, 2016

[C 202] L. Gardini and I. Sushko "Bifurcation structure in a family of discontinuous linear-power maps" ADVANCES IN NONSMOOTH DYNAMICS, CRM (Barcelona, Spain) February 1-5, 2016

[C 203] I. Sushko and L. Gardini "Codimension-two bifurcation and robust chaos in a 1D piecewise smooth map" European Conference on Iteration Theory (ECIT 2016), Innsbruck, Austria, September 4-10, 2016.

[C 204] L. Gardini, R. Makrooni and I. Sushko "Bifurcation structure in a family of discontinuous linear - power maps", European Conference on Iteration Theory (ECIT 2016), Innsbruck, Austria, September 4-10, 2016.

[205] Roya Makrooni and L. Gardini, Piecewise monotone maps chaotic in the whole interval, Progress on Difference Equations, PODE-2017, Urbino May 27-30, 2017, Urbino, Italy

[206] I. Sushko and L. Gardini: Smale Horseshoe in 2D Noninvertible Maps, Progress on Difference Equations, PODE-2017, Urbino May 27-30, 2017, Urbino, Italy

[207] Davide Radi, L. Gardini and P. Harting: An evolutionary generalization of the Shelling's neighborhood tipping model: Inequality and segregation, Progress on Difference Equations, PODE-2017, Urbino May 27-30, 2017, Urbino, Italy

[208] Laura Gardini and Z. Du: Notes on the anharmonic routes in piecewise monotone maps, Progress on Difference Equations, PODE-2017, Urbino May 27-30, 2017, Urbino, Italy

[209] D. Radi and L. Gardini "Heterogeneous behavioral rules in quantity-setting oligopolies with bounded rational firms: A spiteful firm plays the Walrasian equilibrium" presentation at the 22nd Annual Workshop on Economic Science with Heterogeneous Interacting Agents (WEHIA-2017), Università Cattolica del Sacro Cuore in Milan, Italy, June 12-14, 2017.

[210] I. Sushko and L. Gardini: Snap-back repellers and critical homoclinic orbits, International Conference on Difference Equations and Applications, ICDEA 2017, July 24-28, Timisoara, Romania

[211] L. Gardini, **Invited Plenary talk**, Bifurcations in Smooth and PWS noninvertible maps, , International Conference on Difference Equations and Applications, ICDEA 2017, July 24-28, Timisoara, Romania

[212] I. Sushko, L. Gardini, K. Matsuyama: Fashion Cycles: a Discrete Time Analysis, Nonlinear Economic Dynamics, NED 2017, September 7-9, Pisa, Italy

[213] I. Sushko, L. Gardini, K. Matsuiamy: Globalization and Coupled Chaotic Fluctuations of Innovation, AMASES-2017, 14-16 settembre 2017, Cagliari, Italy

[214] L. Gardini, **Invited Plenary talk**, Smooth and piecewise smooth noninvertible maps and applications in Economics and Social Sciences, AMASES-2017, 14-16 settembre 2017, Cagliari, Italy

[215] Laura Gardini, V. Mañosa and I. Sushko, "A route to chaos in the Boros--Moll map" International Conference on Difference Equations and Applications, ICDEA, Dresden, May 21-25, 2018

[216] Davide Radi and Laura Gardini "A piecewise smooth model of evolutionary game for residential mobility and segregation", International Conference on Difference Equations and Applications, ICDEA, Dresden, May 21-25, 2018

[217] Iryna Sushko, Laura Gardini and Kiminori Matsuyama "2D Discontinuous Piecewise Linear Map: Emergence of Fashion Cycles", International Conference on Difference Equations and Applications, ICDEA, Dresden, May 21-25, 2018

[218] Laura Gardini, and I. Sushko, "Growing through chaos in the Matsuyama map", International Conference on The Economy as a Spatial Complex System, (ESCOS 2018), Napoli, June 21-22, 2018

[219] Iryna Sushko, Laura Gardini and Kiminori Matsuyama "Dynamics of a discrete-time fashion cycle model", International Conference on The Economy as a Spatial Complex System, (ESCOS 2018), Napoli, June 21-22, 2018

Invited Plenary Speaker

[220] Laura Gardini, and I. Sushko, "Bifurcations in a family of rational Maps", International "European Conference on Iteration Theory" ECIT 2018, Murcia (Spain) July 3-7, 2018

[221] Iryna Sushko, L. Gardini and K. Matsuyama "Globalization and Coupled Chaotic Fluctuations of Innovation" International Workshop MDEF (Dynamic Models in Economics and Finance), 6-8 settembre 2018, URBINO.

Plenary talk:

[222] L. Gardini, A. dal Forno and U. Merlone "Dynamics and Border Collision Bifurcations of a model of impulsive binary choices", PODE-2019 (Progress on Difference Equations) Braganca, Portogallo, 26-30 maggio, 2019.

Invited Plenary talk:

[223] D. Radio and L. Gardini "Piecewise-Smooth Models of Residential Segregation", PODE-2019 (Progress on Difference Equations) Braganca, Portogallo, 26-30 maggio, 2019.

INVITED for collaborations

- [1] L. Gardini "Homoclinic bifurcations of expanding fixed points and saddles in 2-dim. non invertible maps", one-hour invited lecture at Meeting "Differential Equations, Bifurcations and Chaos", Katsiveli, Crimea, Ukraine, 3-14 Maggio 1994.
- [2] L. Gardini "On some bifurcations in noninvertible maps", one-hour invited lecture at Workshop "Noninvertible Dynamical Systems", Minneapolis 14-18 Marzo 1995.
- [3] L. Gardini two one-hour invited lessons: "Critical curves and Absorbing areas" e "Homoclinic bifurcations" at School-Workshop "Chaotic Synchronization and Two-Dimensional Maps", Technical University, Lyngby, Danimarca, 18-21 maggio 1998.
- [4] Organizza una "Special Session" dal titolo "Discrete Dynamics, Chaos and Applications"

all'European Conference on Operational Research, Bruxel, 12-15 giugno 1998.

- [5] Nel 1998 è stata invitata (dal prof. E. Mosekilde) a trascorrere un mese come Visiting Professor alla Technical University, Lyngby, Danimarca. Fa solo una "breve visita" con seminario.
- [6] Nel 1999 è stata invitata (dal prof. C. Chiarella) a trascorrere un mese come Visiting Professor alla School of Finance and Economics, University of Technology, Sydney, Australia. Collabora con lui su diversi temi di ricerca.
- [7] Nel 1999 è stata invitata (dal prof. C. Hommes) a trascorrere un mese come Visiting Professor al Department Economics, University of Amsterdam, Olanda. Fa solo una "breve visita".

Nel 2000 è stata invitata (dal prof. V. Shalfeev) a trascorrere un mese come Visiting Professor al Department of Oscillations, University of Nizny-Novgorod, Russia.

Nel 2000 è stata invitata (dal prof. G. Kristensen) a trascorrere un mese come Visiting Professor al Department of Statistics, University of Odense, Danimarca. Fa una "breve-visita" di una settimana 23-28 ottobre 2000.

Invitata alla conferenza in onore di R. Day, University of Southern California, Aprile 2003

Invitata per un seminario presso il Dip. Di Matematica Univ. di Genova, Marzo 2005

Invitata per un seminario presso il Dip. Di Matematica Univ. di Bologna, Aprile 2005

Invitata per un seminario presso il Dip. Di Economia Univ. di Piacenza, Maggio 2005

Invitata per un seminario a Cosenza, Univ. della Calabria, Luglio 2005

Invited Lecture at "Transdisciplinary Perspectives on Economic Complexity", James Madison University, Harrisonburg, Virginia, USA, May 16-17, 2008.

Interview to Mauro Gallegati and Laura Gardini. Ch.6 in the book "European Economics at the Crossroads", J. Barkley Rosser, Kirby L. Cramer, Richard P.F. Holt and David Colander Ed.s, April 2010, Edward Elgar.

Invited Lecture alla "Summer School on Risk Measurement and Control", Roma, Luglio 2008.

Invited Lecture "Introduction to Discrete Dynamical Systems" at the Tutorial Workshop "Nonlinear Dynamics in Economic Models", at CIFREM (Interdepartmental Centre for Research Training in Economics and Management), Trento, March 12-13, 2009.

Invited Lecture "Noninvertible Maps" at the conference "The 6th International Conference on Nonlinear Economic Dynamics" 31 May-2 June 2009, Jönköping University, Sweden.

Invited Talk "On the complicated price dynamics of simple one- and two-dimensional discontinuous financial markets with heterogeneous interacting traders" by L. Gardini, F. Tramontana, Xue-Zhong He, F. Westerhoff

At the Workshop "Evolution and market Behavior in Economics and Finance" Pisa, Scuola Superiore Sant'Anna, Oct. 2-3 2009.

Invited Talks Facoltà di Economia Univ. di Cosenza, 19 Ottobre 2009:

- 1) Laura Gardini, Cars Hommes, Fabio Tramontana, Robin de Vilder "Forward and Backward Dynamics in implicitly defined Overlapping Generations Models"
- 2) L. Gardini, I. Sushko and A. Naimzada, "Growing through chaotic intervals".

Invited Visitor (da Tõnu Puu) presso il CERUM, Umeå University, SE-90187 Umeå, Sweden, nel periodo 2-5 giugno 2010. Ha tenuto una Invited Lecture "Some Properties of Noninvertible Maps" at the Physics Department, University of Umea, Sweden, June 4, 2010.

Invited Visitor (da Viktor Avrutin and Michael Schanz) all'Institute of Parallel and Distributed Systems, University of Stuttgart, Germany nei periodi: 14-18 marzo 2010, 10-15 ottobre 2010.

Invited Lecture al Workshop Vigo's workshop "Future Directions in Difference Equations" organizzato da V. Mañosa and Eduardo Liz, Luglio 2011.

QUADERNI di ISTITUTO o DIPARTIMENTO

- [Q1] L. Gardini, C. Mammana, M.G. Messina "Sulla dinamica delle popolazioni", (Quaderno n. 5 dell'Istituto di Matematica, Facoltà di Ingegneria, Università di Ancona, agosto 1985.
- [Q2] L. Gardini "Linee Critiche in una mappa bidimensionale di interesse economico", Quaderno n. 8904 del Gruppo Nazionale M.U.R.S.T. "Modelli Nonlineari in Economia e Dinamiche Complesse", dicembre 1989.
- [Q3] L. Gardini "On the dynamics of two-dimensional endomorphisms", Quaderno n. 9001 del Gruppo Nazionale M.U.R.S.T. "Modelli Nonlineari in Economia e Dinamiche Complesse", dicembre 1989.
- [Q4] L. Gardini C. Mira "A procedure to determine chaotic and absorbing areas in two-dimensional endomorphisms", Quaderno n. 9002 del Gruppo Nazionale M.U.R.S.T. "Modelli Nonlineari in Economia e Dinamiche Complesse", 1990.
- [Q5] L. Gardini "Modelli di Greenwald-Stiglitz e Gallegati-Stiglitz: centri e cicli limite", Quaderno n.5 dell'Istituto di Scienze Economiche, Facoltà di Economia e Commercio, Università di Urbino, febbraio 1991.
- [Q6] L. Gardini "Studio, sulle biforcazioni globali in endomorfismi piani", Quaderno n.6 dell'Istituto di Scienze Economiche, Facoltà di Economia e Commercio, Università di Urbino, marzo 1991.
- [Q7] L. Gardini e C. Mammana "Snap-Back Repellers ed altre biforcazioni", Quaderno n. 5 del Dipartimento di Matematica, Fac. di Ingegneria, Università di Ancona., maggio 1991.
- [Q8] L. Gardini "Absorbing areas and their bifurcations", Quaderno n.16 dell'Istituto di Scienze Economiche, Facoltà di Economia e Commercio, Università di Urbino, marzo 1992.
- [Q9] L. Gardini e R. H. Abraham "About a map of coupled oscillators", Quaderno n. 20 dell'Istituto di Scienze Economiche, Facoltà di Economia e Commercio, Università di Urbino, maggio 1992.
- [Q10] L. Gardini e C. Mira "On the dynamics of triangular maps", Quaderno N.9305 del Gruppo M.U.R.S.T. "Dinamiche non lineari ed Applicazioni. alle Scienze Economiche e Sociali" Urbino,1993.
- [Q11] M. Gallegati, L. Gardini e J. Stiglitz "Aperiodic fluctuations in a nonlinear model with financial market imperfections", Quaderni di Economia, Matematica e Statistica N.30, Facoltà di Economia, Università di Urbino, 1994.
- [Q12] C. Mammana e L. Gardini "Fluactuations in financial markets: bounded stochastic trajectories", Quaderno N.11 del Dipartimento di Matematica "V. Volterra", Università di Ancona, maggio 1994.
- [Q13] G.I. Bischi, L. Gardini "Mann iterations reducible to plane endomorphisms", Quaderni di Economia, Matematica, e Statistica N.36, Facoltà di Economia, Università di Urbino, 1996.
- [Q14] G.I. Bischi, A. Naimzada., L. Gardini "Infinite distributed memory in discrete dynamical systems" Quaderni di Economia, Matematica e Statistica N.39, Università di Urbino, 1996.
- [Q15] G.I. Bischi, L. Gardini "Trasformazioni puntuali iterate e caos deterministico" Quaderni dell'Istituto di Matematica dell'Università di Parma, 1998.
- [Q16] G.I. Bischi, L. Gardini "Cycles and bifurcations in duopoly games " Quaderni dell'Istituto di Matematica dell'Università di Parma, 1998.

- [Q17] R. Dieci, L. Gardini, G.I. Bischi "Global dynamics in a Kaldor-type business cycle model " Quaderni dell'Istituto di Matematica dell'Università di Parma, 1998.
- [Q18] C. Chiarella, R. Dieci, L. Gardini, "Asset price dynamics in a financial market with fundamentalists and chartists " Quaderni dell'Istituto di Matematica dell'Università di Parma, 1999.
- [Q19] A. Agliari, L. Gardini, T. Puu "The dynamics of a triopoly Cournot game" Contributi di ricerca in Econometria e Matematica. Istituto di Econometria e Matematica per le Decisioni Economiche, Università Cattolica del Sacro Cuore di Milano, n.31, 1999
- [Q20] R. Dieci, L. Gardini, G.I. Bischi " A triangular map describing a bi-stable economic model " Quaderni dell'Istituto di Matematica dell'Università di Parma, n.8, Dicembre 1999.
- [Q21] G.I. Bischi, L. Gardini " Equilibrium selection and transient dynamics under adaptive and statistical learning" Quaderni dell'Istituto di Matematica dell'Università di Parma, n.9, Gennaio 2000.
- [Q22] C. Chiarella, R. Dieci, L. Gardini, "Speculative Behaviour and Complex Asset Price Dynamics", *Quantitative Finance Research Paper Series*, n. 49, School of Finance and Economics, University of Technology Sydney, March 2001 (<http://www.business.uts.edu.au/qfrc/research/publications.html>).
- [Q23] A. Agliari, L. Gardini, C. Chiarella "Adaptive expectations in models of monetary dynamics" Contributi di ricerca in Econometria e Matematica. Istituto di Econometria e Matematica per le Decisioni Economiche, Università Cattolica del Sacro Cuore di Milano, 2002.
- [Q24] Ilaria Foroni, Laura Gardini, J. Barkley Rosser Jr. "Adaptive and statistical expectations in a renewable resource market " Università Cattolica del Sacro Cuore di Milano, 2002.
- [Q25] C. Chiarella, R. Dieci, L. Gardini, "A dynamic analysis of speculation across two markets", *Quantitative Finance Research Paper Series*, n. 89, School of Finance and Economics, University of Technology Sydney, January 2003 (<http://www.business.uts.edu.au/qfrc/research/publications.html>).
- [Q26] M. Ciaschini, R. Dieci and L. Gardini "Nonlinearity in a multi-sector dynamic model ", Quaderni di Economia, Matematica e Statistica N.84, Università di Urbino, 2003.
- [Q27] C. Chiarella, R. Dieci, Laura Gardini, "Asset price and wealth dynamics in a financial market with heterogeneous agents", *Quantitative Finance Research Paper Series*, n. 134, School of Finance and Economics, University of Technology Sydney, October 2004 (<http://www.business.uts.edu.au/qfrc/research/publications.html>).
- [Q30] R. Dieci, I. Foroni, Laura Gardini, X-Z He "Market Mood, Adaptive Beliefs and Asset Price Dynamics", *Quantitative Finance Research Paper Series*, n. 162, School of Finance and Economics, University of Technology Sydney, August 2005 (<http://www.qfrc.uts.edu.au>).
- [Q31] F. Tramontana, L. Gardini and T. Puu "Cournot duopoly with capacity limit plants" Quaderno di Ricerca N.314, Dipartimento di Economia, Università Politecnica delle Marche, Ancona. Febbraio 2008.

LAURA GARDINI

ELENCO DELLE PUBBLICAZIONI

- [1] P. Gavalotti, G. Celeri, B. Leonardis and L. Gardini "Calculation of multicomponent multiphase equilibria", *Chem. Eng. Sci.*, 35 (1980) 2297-2304.
- [2] L. Gardini and A. Servida, M. Morbidelli, S. Carrà "A unified collocation algorithm for packed-bed Chemical reactor simulation", *Chem. Eng. Commun.*, 43 (1986) 85-105.
- [3] L. Gardini and A. Servida, M. Morbidelli, S. Carrà "Use of orthogonal collocation on finite elements with moving boundaries for fixed-bed catalytic reactor simulation", *Computer and Chem. Eng.*, 9 (1985) 1-17.
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- [L17] Special issue in *CHAOS an Interdisciplinary Journal* (2018), “Nonlinear Economic Dynamics”, Guest Editors: Laura Gardini, Luca Gori, Luca Guerrini, and Mauro Sodini.
- [L18] Special issue in *Journal of Difference Equations and Applications* (2019), Proceedings of ECIT 2018, Guest Editors: Francisco Balibrea, Laura Gardini, Marek Zdun.
- [L19] Special Isse in *Chaos Solitons & Fractals* (2019) “Dynamic Models in Economics and Social Sciences” Guest Editors: Laura Gardini, Davide Radi, Fabio Tramontana
- [L20] V. Avrutin, L. Gardini, I. Sushko and F. Tramontana, “Continuous and Discontinuous Piecewise-Smooth One-Dimensional Maps: Invariant Sets and Bifurcation structures”, World Scientific, Singapore, 2019, 648 pages, ISBN: 978-981-4368-82-7.

Programmati ed approvati dalle riviste:

Special Issue su *Journal of Difference Equations* 2020 (per PODE-19)

Special Issue su *Nonlinear Dynamics* 2020 (su invito dell’Editor in Chief)

Special Issue su *Journal of Economic Interaction and Coordination*, 2020 (per NED 2019)

Special Issue *Discrete and Continuous Dynamical Systems -Series B*, 2020 (per NED 2019)

B)Current position: since 1st January 2005, Professor at the Faculty of Economics, University of Macerata

C)Previous positions:

- Scholarship recipient from Istituto di Alta Matematica "F. Severi", at "La Sapienza" University in Rome, academic years 1981-82, 1982-83;
- Researcher at the Faculty of Engineering, University of L'Aquila for the scientific-discipline sector n. 90 (Mathematical Analysis) from 1983-84 to 1986-87;
- Confirmed researcher for the scientific-discipline sector n. 90 in academic year 1987-88 at the Faculty of Engineering, University of L'Aquila, and from academic year 1988-89 to 1997-98 at the Faculty of Engineering, University of Ancona, further to transfer;
- Associate professor for the scientific-discipline sector S04A (Mathematics for Economy Applications) at the Faculty of Political Sciences, University of Macerata from 1998-99 to 2001-02;
- Confirmed associate professor for the scientific-discipline sector SECS-S/06 (Mathematical Methods of Economics and Actuarial and Financial Sciences), at the Faculty of Economics, University of Macerata, from 2001-02 to December 2004.

D)Education: Masters Degree awarded from the University of Camerino, 23rd October 1981, graded 110/110 cum laude.

E)Research:

- Dynamic systems: stability, global properties, bifurcations, basins, critical lines, analysis of complex behaviours, global attractors of non-autonomous dynamic systems;
- Applications to economic and financial models: duopoly models, cobweb models with learning, growth models, real models of credit-constrained emerging economies;
- Equations at partial derivatives.

F)Conference attendance: Chairman and/or Speaker at many national and international meetings in the field of dynamic systems and differential equations, iteration theory, dynamic models in Economics and Finance, Econophysics.

G)Teaching:

- Head professor of General Mathematics in the 3-year degree course "Economics: banks, companies and markets" and teaching contract in Mathematical Methods for Economics and Finance, part of the specialist degree course in Financial Markets and Brokers, at the Faculty of Economics, University of Macerata;
- Teaching in the following courses: Mathematical Analysis I, Mathematics for economists, Financial Mathematics I, Mathematics foundations.

H)Affiliations:

- Member of the the teaching staff for the PhD Program in Metodi Quantitativi per la Politica Economica (MQPE) at the University of Macerata from 2014
- Member of the teaching staff for the the PhD Program in Political Economics and Legislation of

Institutions and International Financial Markets (at "La Sapienza" University in Rome) from 1998 to 2008

- Member of the Board of Administration of the University of Macerata from 2002-03 to 2005-06

- Head of CETRI (University centre for professional training and corporate relationships) at the University of Macerata from 2003-04 to 2005-06.

- Appointed by the University Chancellor as coordinator of relationships with corporate and professional bodies, from 2003-2004 to 2005-06.

- Coordinator of the Master titled "Expert in generational development processes" at the Faculty of Economics, University of Macerata, from 2004-05 to 2006-07.

- Director and professor at the Master in "Quantitative Finance" at the Faculty of Economics, University of Macerata, academic year 2007-08.

- Head of Economic and Financial Institutions Department since academic year 2007-08.

I) Research funded (as coordinator):

- Local coordinator for the PRIN 2009 "Structural change and growth" (Coordinator prof. Neri Salvadori), dall'a.a. 2011-2012 all'a.a. 2012-2013

- MPI-MURST 60% "Dynamic models in Economics and Finance", since 1998-99.

- Local coordinator for the CNR PROJECT "Deterministic and Stochastic dynamics in Economics and Finance" (Coordinator prof. Luciano Stefanini), from 1996-97 to 1999-2000.

- Head of the CNR-NATO PROJECT "Global Attractors of Continuous and Discrete Dynamical Systems and Their Applications to Control Theory and Economic Dynamics" from 2001 to 2003.

- Scientific coordinator of the RESEARCH PROJECT titled "Use of Discrete Dynamic Systems Theory tools in Economics" at the Department of Economic and Financial Institutions, University of Macerata, from 2003-04 to 2007-08.

L) Research funded (participation):

- PRIN "Circular income flow and environment: data base and disaggregated analysis of policies" (Coordinator prof. Laura Gardini), 2004-05

- PRIN "Production, income and environment: statistic bases and multisectoral dynamics" (Coordinator prof. Laura Gardini), 2002-03.

- PRIN "Strong sectoral interaction: quantitative analysis attempt" (Coordinator prof. Laura Gardini), 2000-01.

- PRIN "Management of country risk: systemic aspects and methods for its calculation and control" (Coordinator prof. Giorgio Szego), 1999-2000. - PRIN "Dynamics of production sectors and chaotic equilibrium" (Coordinator prof. Franco Gori), 1998-99.

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2018 Grassetto, F., Hunanyan, G., Mammana, C., Michetti, E., **A note on the influence of saving behaviors on economic growth** in *METROECONOMICA*; online; Oxford, Wiley-Blackwell; pp. 1 - 16 (ISSN: 0026-1386) [[» web resource](#)]

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