

April 2023

## **CURRICULUM VITAE of ROSANNA GRASSI**

### **Personal data**

*Work address:* Università di Milano – Bicocca, Via Bicocca degli Arcimboldi, 8, 20126 Milano. Tel 0264483136, E-mail [rosanna.grassi@unimib.it](mailto:rosanna.grassi@unimib.it)

Scopus: <https://www.scopus.com/authid/detail.uri?authorId=16506843400>

Orcid ID <https://orcid.org/0000-0001-5292-1723>

### **Academic position:**

**2022-now** Full professor at University of Milano-Bicocca, Dept. of statistics and Quantitative Methods, SSD SECS-S06 Mathematical Methods of Economy, Financial and Actuarial Sciences

**2011-2022** Associate professor at University of Milano-Bicocca, , Dept. of statistics and Quantitative Methods, SSD SECS-S06 Mathematical Methods of Economy, Financial and Actuarial Sciences

**2000-2011** Assistant professor at University of Milano-Bicocca, Dept. of statistics and Quantitative Methods, SSD SECS-S06 Mathematical Methods of Economy, Financial and Actuarial Sciences

### **Educational Qualification**

- Degree in Mathematics, year 1995 University of Milan
- PhD in “Mathematics for the Analysis of Financial Markets”, year 2000 University of Brescia

### **Research interests**

Complex networks, Graph Theory, Centrality measures, Network topological indicators, Operation research, Network approach and portfolio theory

### **Reviewer activity**

Annals of Operations Research, Scientific Reports, Social Networks, Physica A, Mathematical Review, European Journal of Operational Research, The European Physical Journal B, Discrete Dynamics in Nature and Society, Quality and Quantity, Network Science, Empirical Economics

### **Scientific Society Affiliation:**

Euro Working Group of Financial Modelling

AMASES (Associazione per la Matematica Applicata alle Scienze Economiche e Sociali)

SICC - Società Italiana Caos e Complessità

CSS - Complex Systems Society

### **International Research Group Membership**

GNAMPA Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro Applicazioni

ECONOPHYSICS NETWORKS

### **Invited talks**

**May 25-27, 2022 Perugia** – ICRA9, 9th International Conference on Risk Analysis, Systemic risk assessment through higher order clustering coefficient

**February 11, 2022 Rome** – CRN - Consiglio Nazionale delle Ricerche, The effect of the pandemic on complex socio-economic systems: community detection induced by communicability

**April, 2 2019, Trento** - School of International Studies, University of Trento - Centrality measures to identify leaders in criminal networks

**February, 26 2019, Macerata** – Network measures in socio-economic models: a mathematical perspective

### **Conferences**

**June 30- July 1, 2022 Rome** – CNR – Consiglio Nazionale delle Ricerche, 10th International Workshop on Computational Economics and Econometrics, Eigenvector centrality as an indicator of high-funded European projects: a novel approach using the dual projection method

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**June, 22-24 2022 Catania** – WHEIA 2022 Workshop on Economic Science with Heterogeneous Interacting Agents, The multilayer architecture of the global input-output network and its properties

**April 22, 2022 Cagliari**- IAERE 2022, Environmentally extended input-output analysis in complex networks: a multilayer approach

**July, 11-14 2021 Athens**– University of Athens, Euro 2021 – 31th European conference for Operational Research, Clustering coefficients in financial multilayer networks

**June, 28-29 2021 Milano** – Università Cattolica del Sacro Cuore di Milano, WEHIA 2021 Workshop on Economics with Heterogeneous Interacting Agents, Community Detection based on Communicability in a Multiplex Framework Networks

**May, 26-28 2021 – Dijon** - French Regional Conference on Complex Systems FRCCS 2021, Online conference, Country Centrality in the International Trade Network and the COVID-19 Pandemic

**December, 7-11, 2020** – Conference on complex systems CCS2020, Online conference, Community structure in the World Trade Network based on communicability distances

**September 18, 2020** - eMAF2020, Online conference, Network approaches based on performance and dependence structure for portfolio allocation

**December 10-12, 2019, Lisbon** - Complex Networks 2019, 8th International Conference on Complex Networks and their Applications, Community structures based on multi-attributes in International Trade Network

**September, 9- 11 2019, Perugia** – 43<sup>th</sup> Amases Meeting, Community structure based on multi-attributes in International Trade Network

**June, 24-26 2019, London** - City University of London, WEHIA 2019, 24th Workshop on Economic Science with Heterogeneous Interacting Agents, Communities in international trade network: new evidence using communicability

**June, 24-26 2019, Dublin** - Network approaches based on performance and dependence structure for portfolio allocation Euro 2019

**October, 9-12 2018, Paris, France** – Dyses 2018, Systemic risk assessment through higher order clustering coefficient

**July, 8-11 2018, Valencia, Spain** – Euro 2018 29<sup>th</sup> European Conference on Operational Research Networks and market-based measures of systemic risk: the global banking system in the aftermath of the financial crisis

**January, 24-26 2018, Rome, Italy** - XIX Workshop on Quantitative Finance – QFW2018, A Portfolio Model for Minimizing Systemic Risk (joint work with R. Castellano, R. Cerqueti, G. Clemente)

**September, 14-16 2017, Cagliari, Italy**, - 41<sup>st</sup> Amases Meeting, Structure of control in financial networks: an application to the Brazilian stock market (Joint work with M. Piaia Abreu)

**September, 6-8 2017, Lisboa, Portugal** - Optimization 2017, Directed clustering in weighted networks: a new perspective, (joint work with G. Clemente)

**June, 12-14, 2017, Milan, Italy** – WEHIA 2017, 22th Workshop on Economic Science with Heterogeneous Interacting Agents, Directed clustering as a measure of systemic risk: a new perspective

#### **Member of scientific committee :**

- DYSES 2022: Dynamics in socio-Economic systems, Rouen 2022, October th
- Workshop Complex Networks, Milan, 2022, May 13<sup>th</sup>
- NET 2019: Workshop on Network Models In Statistics, Economics and Social Sciences, Milan, 2019, November 14-15<sup>th</sup>
- DYSES 2018: Dynamics in socio-Economic systems, Paris 2018, October 9-12th
- NET 2011 Networks: Topology and Dynamics, Milan, 2011, May 31th
- NET 2010 Networks: Topology and Dynamics, Milan, 2010, June, 14-16th
- NET 2009 Networks: evolution and complexity, Rome, 2009, May 28-30th
- NET 2008 Networks structure and complexity, Trento, 2008 June 12-14th
- NET 2007 Networks: Topology and Dynamics, Urbino, 2007, May 17-19th
- NET 2006 Networks: Topology and Dynamics Verbania-Intra, , 2006, May 4-5th
- 8-th Italian-Spanish Meeting on Financial Mathematics, Verbania, 2005, July

### Scientific collaborations

- November 2019 - Organizer of the international meeting NET 2019: Workshop on Network Models In Statistics, Economics and Social Sciences, Milan on 14<sup>th</sup> - 15<sup>th</sup> of November 2019
- October 2018 - Organizer of the special session “Networks and systemic risk” International meeting DYSES2018 Dynamics of Socio-Economic Systems, with Prof. Simone Alfarano and Prof. Gabriele Tedeschi (Jaume I University, Castellon, Spain), Paris 2018, October 9-12th
- September 2014 - Organizer of the special session “Socio-Economics and Financial Networks” International meeting DYSES2014 Dynamics of Socio-Economic Systems, with Prof. Simone Alfarano (Jaume I University, Castellon, Spain), September 15-17, 2014 Seville, Spain
- June 2018 - Co-advisor of PhD-thesis for the student Mariana Piaia Abreu, with Prof. Renata Del Vecchio, (University Federal Fluminense, Instituto de Matemática Niterói, Rio de Janeiro, Brazil, from March to October 2017
- June 2021 - External examiner of PhD thesis for the student Alhanouf Ali Alhomidhi, Department of Mathematics and Statistics, University of Strathclyde, Glasgow

### Editor activity

- Member of the Advisory Board of the Journal of Applied Quantitative Methods, ISSN 1842-4562 (since 2017)
- Member of the Editorial Board of the Journal *Advances in Networks*, Science Publishing Group, ISSN:2326-9766 (Print) ISSN:2326-9782 (Online) (since 2014-2017)
- 2014 - Guest editor of the Journal *Quality and Quantity* for the special issue “Qualitative and quantitative methods in complex socio-economic systems” (with M. Fattore)

### PUBLICATIONS

1. Bartesaghi P., Clemente G.P., Grassi R. (2023). Taxonomy of cohesion coefficients for weighted and directed multilayer networks. *Chaos, Solitons & Fractals*, 166, 112968.
2. Bartesaghi P., Clemente G.P., Grassi R. (2023). Clustering coefficients as measures of the complex interactions in a directed weighted multilayer network. *Physica A: Statistical Mechanics and its Applications*, 610, 128413.
3. Bartesaghi, P., Clemente, G. P., Grassi, R., Luu, D. T. (2022). The multilayer architecture of the global input-output network and its properties. *Journal of Economic Behavior & Organization*, 204, 304-341.
4. Bartesaghi P., Clemente G.P., Grassi R.
5. (2022) A tensor-based unified approach for clustering coefficients in financial multiplex networks. *Information Sciences*, 601, 268-286., *Information Science*
6. GP. Clemente, R. Grassi, A. Hitaj (2022), Smart network based portfolios, *Annals of Operations Research*, doi.org/10.1007/s10479-022-04675-7
7. R. Antonietti, P. Falbo, F. Fontini, R. Grassi, G. Rizzini (2022). The world trade network: country centrality and the COVID-19 pandemic. *Applied Network Science*, 7(1), 1-29.
8. A. Arcagni, V. Candila, R. Grassi, (2022). A new model for predicting the winner in tennis based on the eigenvector centrality. *ANNALS OF OPERATIONS RESEARCH*, DOI 10.1007/s10479-022-04594-7.
9. S. Benati, P. Bartesaghi, GP. Clemente, R. Grassi (2021). Multi-attribute community detection in International Trade Network, *NETWORKS AND SPATIAL ECONOMICS*, 21 (3), 707-733
10. P. Bartesaghi, GP. Clemente, R. Grassi (2020). Community structure in the World Trade Network based on communicability distances, *JOURNAL OF ECONOMIC INTERACTION AND COORDINATION*, 10.1007/s11403-020-00309-y
11. R. Castellano, R. Cerqueti, GP. Clemente, R. Grassi (2020). An optimization model for minimizing systemic risk. *MATHEMATICS AND FINANCIAL ECONOMICS*, 10.1007/s11579-020-00279-6
12. R. Cerqueti, GP. Clemente, R. Grassi (2020), Stratified cohesiveness in business complex networks, *JOURNAL OF BUSINESS RESEARCH*, 10.1016/j.jbusres.2020.04.005
13. P. Bartesaghi, M. Benzi, GP. Clemente, R. Grassi, E. Estrada (2020) Risk-dependent centrality in economic and financial networks, *SIAM Journal of Financial Mathematics*, 11 (2), pp. 526-565

14. M. P. Abreu, R. Grassi, R. Del Vecchio (2020), Analysis of productive structure applying network theory: The Brazilian case, *Structural Change and Economic Dynamics* 53, DOI: 281-291, 10.1016/j.strueco.2020.03.005
15. R. Cerqueti, GP. Clemente, R. Grassi (2020). Systemic risk assessment through high order clustering coefficient, *ANNALS OF OPERATION RESEARCH*, 10.1007/s10479-020-03525-8
16. GP. Clemente, R. Grassi, C. Pederzoli (2020) *Networks and market-based measures of systemic risk: the European banking system in the aftermath of the financial crisis*. *Journal of Economic Interaction and Coordination* 15, 159–181.
17. A. Arcagni, R. Grassi, S. Stefani, A. Torriero (2019). Extending assortativity: An application to weighted social networks. *JOURNAL OF BUSINESS RESEARCH*, 10.1016/j.jbusres.2019.10.008.
18. R. Cerqueti, GP. Clemente, R. Grassi, (2019). Influence measures in subnetworks using vertex centrality. *SOFT COMPUTING*, 10.1007/s00500-019-04428-y
19. GP. Clemente, R. Grassi, A. Hitaj, (2019). *Asset allocation: new evidence through network approaches*. *Annals of Operations Research* DOI:10.1007/s10479-019-03136-y
20. MP. Abreu, R. Grassi, R. Del Vecchio (2019). *Structure of control in financial networks: An application to the Brazilian stock market*. *PHYSICA A* 522 p. 302-314. DOI:10.1016/j.physa.2019.01.084.
21. R. Grassi, F. Calderoni, M. Bianchi, A. Torriero (2019). *Betweenness to assess leaders in criminal networks: New evidence using the dual projection approach*, *Social Networks* 56 p. 23-32
22. R. Cerqueti, GP. Clemente, R. Grassi, (2019). A network-based measure of the socio-economic roots of the migration flows. *Social Indicators Research*, 146(1-2), 187-204.
23. GP. Clemente, M. Fattore, R. Grassi (2018). *Structural comparisons of networks and model-based detection of small-worldness*. *Journal of Economic Interaction and Coordination*, 13 (1), 117-141
24. P. Bongini, GP. Clemente, R. Grassi, (2018). *Interconnectedness, G-SIBs and network dynamics of global banking*. *Finance Research Letters*, 27, 185-192
25. GP. Clemente, R. Grassi (2018). *Directed clustering in weighted networks: A new perspective*. *Chaos, solitons & fractals*, vol. 107, p. 26-38, ISSN: 1873-2887, doi: 10.1016/j.chaos.2017.12.007
26. Arcagni, A., Grassi, R., Stefani, S., & Torriero, A. (2017). *Higher order assortativity in complex networks*. *European Journal of Operational Research*. vol. 262, p. 708-719, ISSN: 0377-2217, doi: 10.1016/j.ejor.2017.04.028
27. P. Falbo, R. Grassi (2015) *Does expectation of correlation breakdown self-fulfill?* *Discrete Dynamics in Nature and Society* Volume 2015, Article ID 263908, DOI: 10.1155/2015/263908
28. R. Grassi, M. Fattore, A. Arcagni (2015) , *Structural and non-structural temporal evolution of socio-economic real networks*, *Quality & Quantity: International Journal of Methodology*, 49:1597–1608
29. M. Fattore, R. Grassi (2015), *Qualitative and quantitative methods in complex socio-economic systems*, *Quality & Quantity: International Journal of Methodology*, 49:1549–1551
30. L. Bellenzier, R. Grassi, (2014) *Interlocking directorates in Italy: persistent links in network dynamics*, *Journal of Economic Interaction and Coordination*, (9) 2, 183-202
31. M. Fattore, R. Grassi, (2014) *Measuring dynamics and structural change of time-dependent socio-economic networks*, *Quality & Quantity: International Journal of Methodology*, (48) 4, 1821-1834
32. E. Croci, R. Grassi, (2014). *The economic effect of interlocking directorates in Italy: new evidence using centrality measures*. *Computational and Mathematical Organization Theory* 20 (1), 89-112
33. P. Falbo, R. Grassi, (2011) *Market dynamics when agents anticipate correlation breakdown*, *Discrete Dynamics in Nature and Society*, Volume 2011, Article ID 959847, DOI :10.1155/2011/959847
34. R. Grassi, S. Stefani, A. Torriero, (2011) *Using bipartite graphs to assess power in organizational networks: a case study*, *JDyses*, Vol 2 (2), 199-216
35. R. Grassi, (2010) *Vertex centrality as a measure of information flow in Italian Corporate Board Networks*, *Physica A* 389 pp 2455-2464
36. R. Grassi, S. Stefani, A. Torriero, (2010) *Centrality in organizational networks*, *International Journal of Intelligent Systems* Vol. 25 pp 253-265
37. R. Grassi, S. Stefani, A. Torriero (2010), *Extremal properties of graphs and eigencentality in trees with a given degree sequence*, *Journal of Mathematical Sociology*, 34 pp 115-135

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38. R. Grassi, S. Stefani, A. Torriero, (2007), *Some new results on the eigenvector centrality*, Journal of Mathematical Sociology, 31 (3) 237-248
39. Foroni, R. Grassi, (2005) *The contagion process in a financial model: a synergetic approach*, Pure Mathematics and Applications, 16, n. 4