

Economic Networks: Theory and Applications

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Slides + other material will be available at: <http://www.lem.sssup.it/fagiolo/Slides.html>

Outline

Slot 1

1. Introduction

- What is a network
- Classes of networks
- Examples: Social and Economic Networks
- Why networks in economics
- Running example: International Trade Network (ITN)

2. Networks and Graphs

- Definitions
- Multigraphs and digraphs
- Connectivity in graphs
- Moving on a graph
- Distances
- Families of graphs
- Tiered graphs, bipartite graphs, temporal graphs
- Mathematical representations of graphs
- Symmetry
- Visualization

Slot 2

3. Measures and metrics on networks

- Density
- Components
- Diameter, distances, path length
- Degrees and strength
- Homophily and assortative mixing
- Clustering
- Centrality
- Rich-club coefficients
- Community structure
- Minimum spanning tree
- Distributions of metrics in large networks

Slot 3

5. Modeling networks

- A brief overview of the most important network models: Erdos-Renyi, Watts-Strogatz, Barabási-Albert
- Null network models
- Econometric models

5. Economic Applications

- Product-space networks
- Diffusion in macroeconomic networks

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- Vitali, Stefania, Glattgelder, James B., Battiston, Stefano: [The Network of Global corporate Control](#), *PLOS ONE*, 6(10) e25995 (2011)

*** References to additional papers will be given during the course.