SYstemic Risk TOmography: Project Overview

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Boston, 15 December 2014
What’s SYRTO
Who we are
What we do
SYRTO – SYstemic Risk TOmography

- Funded by the European Union under the 7th Framework Programme. Budget: 2.47 mln €.
- Structure:
  - Consortium
    1. University of Brescia (Italy) – UNIT LEADER
    2. CNRS & Paris I Sorbonne (France)
    3. Athens University of Economics and Business – RC (Greece)
    4. University Cà Foscari Venice (Italy)
    5. University of Amsterdam Stichting VU-VUMC (Netherlands)
  - Advisory Board
    I. Scientific Division
    II. Policy Division
Consortium

Our team (28 full-time researchers)

I. UNIVERSITY OF BRESCIA
   • Roberto Savona
     (Primary and Scientific Coordinator)
   • Maurizio Carpita
   • Marica Manisera
   • Marika Vezzoli
   • Paola Zuccolotto
   • Enrico Ciavolino (University of Salento)
   • Silvia Figini (University of Pavia)

II. CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
   • Philippe de Peretti
   • Jorgen Vitting-Andersen
   • Hayette Gatfaoui
   • Dominique Guégan
   • Rania Kaffel
   • Lorenzo Frattarolo

III. ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS – RC
   • Petros DellaPortas
   • Ioannis Vrontos

IV. UNIVERSITY CA’ FOSCARI VENICE
   • Monica Billio
     (Scientific Coordinator)
   • Loriana Pelizzon
   • Roberto Casarin
   • Michele Costola
   • Fulvio Corsi
   • Marcella Lucchetta
   • Domenico Sartore
   • Massimiliano Caporin (University of Padova)

V. UNIVERSITY OF AMSTERDAM STICHTING VU-VUMC
   • Andre Lucas
   • Arjen Siegman
   • Siem Jan Koopman
   • Julia Schaumburg
   • Dirk Schoenmaker
Advisory Board

I. SCIENTIFIC DIVISION
A. RESEARCH UNIT (6 MEMBERS)
  A.1. Researchers working with the University of Brescia
    • Pierluigi Balduzzi (Boston College)
    • Paolo Manasse (University of Bologna and IGIER Bocconi)
  A.2. Researchers working with University Cà Foscari Venice
    • Lorenzo Formi (University of Padua)
    • Mila Getmansky Sherman (UMass Amherst)
    • Andrew W. Lo (MIT Sloan)
    • Roger Stein (MIT Sloan)

B. SUPERVISORY UNIT (15 MEMBERS)
  • Viral V. Acharya (NYU Stern)
  • Yacine Aït-Sahalia (Princeton University)
  • Herman K. Van Dijk (VU University Amsterdam)
  • John Doukas (Old Dominion University)
  • Darrell Duffie (Stanford University)
  • Mardi Dungey (University of Tasmania and University of Cambridge)
  • Paul Embrechts (ETH Zurich)
  • Robert Engle (NYU Stern)
  • Rajna Gibson Brandon (University of Geneva)
  • Christian Gourieroux (University of Toronto and CREST)
  • David Lando (Copenhagen Business School)
  • Norman S. Matloff (UC Davis)
  • Alain Monfort (CREST and University of Maastricht)
  • Stéphane Schaefer (London Business School)
  • Charles J. Stone (UC Berkeley)
Advisory Board (cont’d)

II. POLICY DIVISION (14 MEMBERS)

- Carsten Detken (ECB)
- Gianni Amisano (ECB)
- Lucia Alessi (ECB)
- Thilo Liebig (ESRB, Deutsche Bundesbank)
- Andrea M. Maechler (IMF)
- Simone Manganelli (ECB)
- Bernd Schwaab (ECB)
- Giovanni Dell’Ariccia (IMF)
- Gianni De Nicolò (IMF)
- John Berrigan (DG ECFIN)
- Sebastian Schich (OECD)
- Mario Quagliariello (EBA)
- Kostas Tsatsaronis (BIS)
- Xin Zhang (Sveriges Riksbank)
Our Mission

- Thinking and rethinking the economic and financial system conceived as a system of **Sovereigns**, **Banks with other Financial Intermediaries and Corporations**.

- Our perspective is to look at the financial system as a **biological entity** to be explored in order to identify the **main risk signals** and provide the **right measures of prevention and interventions**.

HIV infected cell

Financial Networks Topology
# Research activity

## How do we do?

The research activity is articulated in Work Packages (WPs)

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Research activity (cont’d)

... and all WPs are conceived as a step-by-step process to realize our two main objectives

**WP 2 – Venice**
*Data Collection*
(1) Data center
(2) Data mgmt

**WP 3 – CNRS**
*Idiosyncratic Risk Mapping*
Risk sources for S–BFIs–C

**WP 4 – Athens**
*Two-way Risk Connections*
Risk connections for S–BFIs–C

**WP 5 – Venice**
*Systemic Risk Indicators*
New measurement approaches and indicators for systemic risk(s)

**WP 6 – Brescia**
*Joint Risk Connections*
Multidimensional risk connections for S–BFIs–C

**WP 7 – Brescia**
*EWS*
Realization of a web-based Early Warnings System with Risk Reports

**WP 8 – VUA**
*SYRTO Code*
(1) EU Governance
(2) Micro-/macro-prudential supervision
EWS

Step 1: Approaches to identify risks and vulnerabilities

We will realize an EWS for S-BFI-C, providing a comprehensive risk analysis covering countries and sectors. We aggregate the individual risk dimensions by using the following methodologies:

- Dynamic Conditional Correlations
- Copula functions and copula-based models
- Granger causality tests
- Principal Component Analysis
- Multiple Indicators Multiple Causes (MIMIC)
- Frailty models
- Dynamic latent component analysis
- Regime-switching models
- Shrinkage-based regressions
- Contingent Claim Analysis (CCA)
- Dynamic Factor Models of Tail Risks
EWS (cont’d)

Step 2: Risk Dashboard – Jointly with ECB (MaRS)

Our aim is to realize a risk dashboard in order to realize a risk mapping and identify potential vulnerabilities within the Eurozone:

- **Sovereign Risks**
- **Bank Risks**
- **Corporate Risks**
- **Market Risks**
- **Credit Risks**
- **Funding and Liquidity Risks**
- **Interlinkages**
- **Composite measures**
- **Policy Uncertainty**
- **Economic Perception (Eurobarometer)**
EWS (cont’d)

Step 3: Risk Thresholds and Warning Signals

- Our aim is to realize a web platform through which verifying in real time the risk profile by web-based data imputation.
- The system should periodically update the entire dataset and model estimates planned in the project.
- Risk Reports articulated in 4 sections will be available for individual Sovereigns, BFIs and Corporations:

1. Rating, specifying the membership risk category and corresponding risk value;
2. Risk Anomalies, i.e. the risk indicators which appear as excessively risky;
3. Risk Assessment, namely the sensitivity towards systemic risk;
4. Risk Impacts, quantifying the potential risk severity of specific risk dimensions.
SYRTO Code

A normative superstructure regarding policy, monetary, and regulatory implication of systemic risks

The objective is to realize a SYRTO Code collecting a series of recommendations and prescriptions on:

1. governance structures;

2. monetary and fiscal systems interactions;

3. micro-/macro-prudential responsibilities.
Chapter I: Prevention

Identification of a series of rules of thumb in order to limit the triggers of systemic risk.
SYRTO Code (cont’d)

The Code will be articulated in three main chapters

Chapter I: Prevention
Identification of a series of rules of thumb in order to limit the triggers of systemic risk.

Chapter II: Mitigation
Limiting systemic shocks transmission and prevent conflicts of interest and ineffective policy interventions.
Chapter I: Prevention
Identification of a series of rules of thumb in order to limit the triggers of systemic risk.

Chapter II: Mitigation
Limiting systemic shocks transmission and prevent conflicts of interest and ineffective policy interventions.

Chapter III: Stabilization
Ex post policy interventions to stabilize the Euro system.
During the second half of 2011 sovereign and banking risks increased in the Eurozone in an environment of weakening macroeconomic growth prospects. Contagion effects have been accelerated by the interplay between vulnerability of public finances and financial sector and have become substantial.

Furthermore, bank funding pressures increased markedly and feed the fear of the Euro crash. In this economic context the major aim of the project is to develop formal measures of systemic risk, in order to capture the linkages and vulnerabilities of the financial system, and regulate the overall level of risk of the system.

Consortium

Here you can check the status of the SYRTO project at Thursday 09 December at 13 pm

Here you can download working papers and other documents of the SYRTO project

Publications

1. Policy related documents
   - First Policy Brief: Analysis

2. Data collection
   - Working papers on data collection, data quality and variables management
   - A proposal for the treatment of "dark horse" properties - Moneta D., Mariani A.

3. Interorganismal Risk
   - Working papers requiring the classification of the fundamental risk sources
   - Monitoring and analyzing large-scale financial system consequences modeling and computing - Lorenzo R., chiếm P., Boga R.
   - Stress testing and stress testing simulations - Giovanni B., Giovanni M., Lorenzo S., Umberto M.
   - Information and communication models for better forecasting - Mattiello F., Ragnar F.
   - Liquidity Demand and Risk Capital - Giovanni P., Giovanni F., Giovanni G., Giovanni L.

4. Two Ways Risk Connections
   - Working papers analyzing and exploring the interrelation and connection among the various options in SYRTO
   - Centre for Research in Financial Markets (CRFM) - Giovanni R., Giovanni M., Giovanni S.
This project is funded by the European Union under the 7th Framework Programme (FP7-SSH/2007-2013) Grant Agreement n° 320270

www.syrtoproject.eu

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