

The University of Paris-Dauphine, Brooklyn College of the City University of New York
and the University of Toronto
jointly organized an International Conference on

New Frontiers in Systemic Risk Measures and Extreme Risk Management

"Are we Ready for the Next Financial Crisis?"

Date / Time: June 4th, 2015 / 9:30 am -6:30 pm
Location: Brooklyn College, 25th Broadway – 7th floor – auditorium

– Conference Minutes –

www.systemic-risk-hub.org

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Organizers: [Christian Gouriéroux](#), University of Toronto and CREST, gouriero@ensae.fr
[Bertrand Maillet](#), University of Paris-Dauphine, bertrand.maillet@dauphine.fr
[Hervé Queneau](#), Brooklyn College, CUNY, hqueneau@brooklyn.cuny.edu

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The conference started with the welcome address of Mrs. **Karen Gould**, President of Brooklyn College, who expressed how delighted she was to host such an event in the Brooklyn College; she also emphasized the importance of such a tripartite relationship (U. Toronto / Paris-Dauphine / Brooklyn College).



Karen Gould, President of Brooklyn College during the opening. Photographers: Craig Stokle & David Rozenblyum.

Hervé Queneau, Professor at Brooklyn College, in the name of the organizers, highlighted the international dimension of the conference, since speakers all came from various continents and countries (US, Canada, France, UK, Spain, Singapore...).



Hervé Queneau, Professor at Brooklyn College. Photographers: Craig Stokle & David Rozenblyum.

Christian Gouriéroux, Professor at the University of Toronto, acknowledged the various sponsors of the conference (GRI in Financial Services, House of Finance and ACPR Chair in Systemic Risk and Regulation) and supports (RBF and SoFiE), and **Bertrand Maillet**,

Professor at University of Paris-Dauphine, thanked all speakers for their reactivity, professionalism and kindness, and underlined the effective support by the administrative staff of Paris-Dauphine and Brooklyn College.

The Chairman of the first session was **Hervé Queneau** (Brooklyn College).

During this session, **Howard Kunreuther**, Professor at the Wharton School, presented his paper "*The Role of Insurance in Reducing Losses from Extreme Events*". This paper describes the challenges consumers, insurers and insurance regulators face in dealing with insurance for low-probability high-consequence events. Given their limited experience with catastrophes, there is a tendency for all three parties to engage in short-term intuitive thinking rather than long-term deliberative thinking when making insurance-related decisions. Public-private partnerships can encourage investment in protective measures prior to a disaster, deal with affordability problems and provide coverage for catastrophic risks. Insurance premiums based on risk provide signals to residents and business as to the hazards they face and enable insurers to lower premiums for properties where steps have been taken to reduce their risk. To address issues of equity and fairness, homeowners who cannot afford insurance could be given vouchers tied to loans for investing in loss reduction measures. The National Flood Insurance Program provides an opportunity to implement a public-private partnership that could eventually be extended to other extreme events. Howard also briefly presented his book, entitled "*Insurance and Behavioral Economics: Improving Decisions in the Most Misunderstood Industry*", which is now available on line.

Then, **Christian Gouriéroux**, Professor at the University of Toronto, presented the second paper of the Conference entitled "*Contagion and Systematic Risk: An Application to the Survival of Hedge Funds*", co-authored with Serge Darolles and Patrick Gagliardini. This paper explores the modeling and measurement challenges of systematic risks and contagion for failure events, with an application to hedge funds' survival. The dependence on individual liquidation risks results either from an exogenous common factor with joint effects on the survival intensities, or from contagion *phenomena* which make the intensities dependent on past liquidations. In order to get tractable models for estimation and prediction purposes, the authors perform the analysis at a semi-aggregate level and consider the liquidation counts of several management styles. They thus introduce a dynamic model for multivariate count data with both lagged count values (contagion) and unobserved factors (dynamic frailty) among the regressors. These assumptions ensure that the joint process of liquidation counts and common factor is affine and facilitate nonlinear prediction at any horizon and estimation by a new method of moments. The empirical analysis of the authors shows that the common factor, the sensitivities to this factor and the contagion scheme can be interpreted in terms of liquidity risks. The factor is related nonlinearly to rollover and margin funding liquidity risks. The sensitivities to the factor are funding liquidity risk exposures, which depend on the redemption and leverage policies of fund managers. The causal scheme captures the reinforcing spiral between funding and market liquidity risks.

After the Q&A, the guests of the Conference and the researchers were invited to a coffee break.

The Chairman of the second session was **Christian Gouriéroux** (University of Toronto).

During this second session, **Jin-Chuan Duan**, Professor at the Business School of National University of Singapore, presented his paper "*Cascading Defaults and Systemic Risk of a Banking Network*" co-authored with Changhao Zhang. In this paper, the authors propose a model which distinguishes systemic risk from its drivers – systematic and idiosyncratic risks. Systemic risk of a banking system arises from cascading defaults due to interbank linkages.

Systemic risk is characterized by systemic exposure and systemic fragility, corresponding to the expected losses and pervasiveness of defaults respectively (under a stress scenario). The model takes into account the banking network, asset-liability dynamics, interbank exposures and netting. Using actual data for 15 British banks, the authors find that systematic shocks are more likely to drive systemic risk, as opposed to banks' idiosyncratic elements. As a cross-product, they also propose a method for ranking banks according to systemic importance.

Subsequently, **Robert Engle**, Professor at New York University Stern School of Business, did his presentation on "*The Prospects for Global Financial Stability*". This presentation was based on several papers including "Measuring Systemic Risk with Dynamic Conditional Beta". Dynamic Conditional Beta (DCB) is an approach to estimating regressions with time varying parameters. The conditional covariance matrices of the exogenous and dependent variable for each time period are used to formulate the dynamic beta. Joint estimation of the covariance matrices and other regression parameters is developed. Tests of the hypothesis that betas are constant are non-nested tests and several approaches are developed including a novel nested model. The methodology is applied to global systemic risk estimation with non-synchronous prices. Finally, since the talk was dedicated to the prospects for global financial stability, Robert did speak about the situation of Systemic Risk in China.

After a vigorous Q&A period, **Rémy Lambinet**, Research Associate at the GRI, then presented the role and aims of the Global Risk Institute in Financial Services (GRI) in Toronto, which is a leading provider of applied, integrative research and education programs. GRI was founded in 2011 as a not-for-profit institute by the Government of Canada, the Province of Ontario, TD Group and Manulife, and currently has 27 member institutions from the financial services sector across Canada. GRI enables financial institutions, policy-makers and regulators to better manage the balance between risk and opportunity by delivering applied research and education programs that build risk capacity and stimulate evidence-based debate for its members and the wider global financial community.

The attendees were invited just after to a lunch break on the premises.

After the break, **Serge Darolles**, Professor at the University of Paris-Dauphine, introduced the House of Finance of the University of Paris-Dauphine. During this speech, he explained that Finance is a fundamentally cross-disciplinary field and, as such, it engages the Dauphine faculty in both teaching and research whatever the area of focus: economics, management, mathematics, information systems, social sciences or law. The House of Finance thus comprises over 30 programs, 100 faculty members, 8 research and teaching chairs and initiatives, and covers a rich and diverse range of subjects, from behavioral finance to risk and asset management. Moreover, it fosters collaborative dynamics; it is a space within which researchers and finance professionals can work together on subjects of common interest. The House of Finance is a uniquely collaborative ecosystem built on partnerships born of trust and recognition for the quality, relevance and applicability of the academic and research programs of the University of Paris-Dauphine. It is a veritable driver for developing stronger partnerships with the business community and for increasing international cooperation thanks to a wide range of collaborative opportunities and innovative, flexible services - all of which contribute to Dauphine's academic excellence. The House of Finance aims to position Dauphine as the academic institution of reference for Finance in France and one of the world's leading universities in the field worldwide.

The Chairman of the third session was **Rémy Lambinet** (GRI in Financial Services).

During this session, **Christophe Pérignon**, Associate Professor at HEC Paris, presented his paper "*Where the Risks Lie: A Survey on Systemic Risk*", co-authored with Sylvain Benoit, Jean-Edouard Colliard and Christophe Hurlin. This paper reviews the extensive literature on systemic risk and connects it to the current regulatory debate. While the authors take stock of the achievements of this rapidly growing field, they also identify a gap between two main approaches. The first one studies different source of systemic risk in isolation, uses confidential data, and inspires targeted but complex regulatory tools. The second approach uses market data to produce global measures, which are not directly connected to any particular theory, but could support a more efficient regulation. According to Christophe and co-authors, bridging this gap will require encompassing theoretical models and improved data disclosure.

Next, **Jón Daniélsson**, Reader at the London School of Economics and co-director of the Systemic Risk Center of the LSE, went on the second presentation entitled "*On the Nature of Financial Risk: Why Risk is so Hard to Measure and Why Risk Models Fail so Often*", based on several pieces of works of the author. The presentation considers the robustness of standard risk analysis techniques, with a special emphasis on those in Basel III and focuses on the relationship between value-at-risk and expected shortfall, the small sample properties of these risk measures and the impact of using an overlapping approach to construct data for longer holding periods. The authors find that VaR is superior to ES in practical applications, highlight the endogenous nature of risk and that risk forecasts are extremely uncertain with very low sample sizes.

The last paper of this session, written by **Rama Cont**, Professor at Imperial College London, "*Endogenous Risk and Price-mediated Contagion: Modeling, Monitoring and Regulation*" and co-authored with Eric Schaanning, was presented. This paper analyses the large-scale deleveraging of assets by distressed financial institutions that have been recognized as an important channel for the contagion of losses during the recent financial crisis. The authors propose a mathematical model for analyzing the impact of fire sales on system-wide losses in a system with multiple financial institutions subject to a macroeconomic stress scenario. The model emphasizes the nonlinear threshold nature of deleveraging, as a result of which the volume of deleveraging is a convex function of initial asset losses. They also show that the magnitude of spillover effects due to price-mediated contagion depends on "liquidity-weighted overlaps" of institutional asset holdings. A key concept which emerges from the model is the notion of indirect exposure of a financial institution to an asset class: it is shown that, when the impact of fire sales is taken into account, the effective exposure of an institution to an asset class may be found to be much larger than the apparent exposure as revealed by the portfolio holdings alone and as illustrated with observations on a dataset of European banks. Finally, the authors show that regulatory risk weights of asset classes may be used as a macroprudential tool for a decentralized regulation of fire sales risk, by providing incentives to financial institutions to reduce their exposure to this contagion channel without revealing confidential information on institutional portfolio holdings.

After this third session (punctuated by lively Q&A), the guests of the Conference and the researchers were invited to a tea break.

Bertrand Maillet, Professor at University of Paris-Dauphine, was the Chairman of the **Special 2015 Session on "Networks"** and last session of the Conference.

During this final session, **Christian Brownlees**, Assistant Professor at the Pompeu Fabra University, presented his paper entitled "*Bank Credit Risk Networks: Evidence from the Eurozone*" co-authored with Christina Hans and Eulalia Nualart. This paper analyses the

credit risk of large financial institutions that is highly interdependent as a result of a number of linkages between financial entities such as exposure to common asset classes and counterparty risk. In this work, the authors propose a novel methodology to study credit risk interconnectedness in large panels of financial institutions. Building upon the standard reduced form framework for credit risk, the authors introduce a model for European financial institutions in which defaults can be triggered by systematic global and country shocks as well as idiosyncratic bank specific shocks. The idiosyncratic shocks are assumed to have a sparse conditional dependence structure that the authors call the bank credit risk network. The authors then develop an estimation strategy based on Lasso regression that allows detecting and estimating network linkages from CDS data. The authors apply this technique to analyze the interdependence of large European financial institutions between 2006 and 2013. Results show that the credit risk network captures a substantial amount of dependence in addition to what is explained by systematic factors.

Just after, **Mila Getmansky Sherman**, Associate Professor at the Isenberg School of Management at UMass Amherst, presented the second paper of this special session, entitled "*Sovereign, Bank and Insurance Credit Spreads: Connectedness and System Networks*" co-authored with Monica Billio, Dale Gray, Andrew W. Lo, Robert C. Merton and Liorana Pelizzon. In this paper, the authors apply several econometric measures of connectedness based on Granger-causality networks to the changes of sovereign risk of European countries and credit risks of Major European, U.S., and Japanese banks and insurers to investigate the evolution of these connections. This allows the authors to calculate the extent of connections between financial institutions and sovereigns and quantify the effects of risk transmission within and across countries and financial institutions. The recent global financial crisis that began in 2007 reminds the authors about the importance of including complex interactions, spillovers, and feedback relationships between financial institutions and sovereigns in the modeling and analysis of financial crises and sovereign risk. The authors examine how vulnerabilities can build up and suddenly result in a financial crisis with potentially disastrous feedback effects for sovereign debt and economic growth. Traditional macroeconomic analysis overlooks the importance of financial system risk, which makes it ill-suited to examine interconnectedness and transmission mechanisms in response to common shocks. Using contingent claims analysis (CCA) and network theory, the authors propose new ways to measure and analyze financial system, sovereign, and credit risks.

Finally, the last presentation of the Conference was given by **Thomas Hurd**, Professor at McMaster University, who briefly presented the structure and some results of his brand new book entitled "*Contagion! The Spread of Systemic Risk in Financial Networks*". The book aims to provide a timely summary of a growing body of systemic risk research as well as a unified mathematical framework for the primary channels that can transmit damaging shocks through financial systems. Much of its contents are new, not having appeared previously in published journals. In the talk, the author has reviewed how to study default and liquidity cascade mechanisms on random financial networks. He finds that large graph analytics are available and computable when the network model has a property called "locally-treelike independence", and the cascade mechanism satisfies a "no direct feedback" condition.

After the last presentation (in a very constrained timing), **Hervé Queneau**, Professor at Brooklyn College, and **Philippe Bernard**, Associate Professor at University of Paris-Dauphine, concluded the Conference by kindly thanking all the speakers, organizers and supporters of this event, and made hopes for being able to organize a new event in a near future.

Some pictures of organizers and speakers taken at the conference are presented below. To see more pictures please click [here](#) or download the entire [album](#) of photos.



Karen Gould, President of Brooklyn College. Photographers: Craig Stokle & David Rozenblyum.



Hervé Queneau, Professor at Brooklyn College. Photographers: Craig Stokle & David Rozenblyum.



Speakers and organizers before the lunch. Photographers: Craig Stokle & David Rozenblyum.



Robert Engle. Photographers: Craig Stokle & David Rozenblyum.



Laure Levent, Patricia Lenfant, Bertrand Mailet, Karen Gould and Philippe Bernard. Photographers: Craig Stokle & David Rozenblyum.



Christian Gouriéroux, Serge Darolles and Rémy Lambinet. Photographers: Craig Stokle & David Rozenblyum.

Program

9:00 am - 9:30 am *Registration*

9:30 am - 9:45 am *Welcome Addresses*

Host: **Karen GOULD** (President of Brooklyn College)

Organizers: **Hervé QUENEAU** (Brooklyn College, CUNY), **Christian GOURIEROUX** (U. of Toronto) and **Bertrand MAILLET** (U. of Paris-Dauphine)

Chair: **Hervé QUENEAU** (Brooklyn College, CUNY)

9:45 am - 10:30 am

Howard KUNREUTHER (Wharton School, U. of Pennsylvania)
"The Role of Insurance in Reducing Losses from Extreme Events"

10:30 am - 11:15 am

Christian GOURIEROUX (U. of Toronto)
"Contagion and Systematic Risk: An Application to the Survival of Hedge Funds"

11:15 am - 11:30 am

Coffee Break

Chair: **Christian GOURIEROUX** (U. of Toronto)

11:30 am - 12:15 pm

Jin-Chuan DUAN (National U. of Singapore)
"Cascading Defaults and Systemic Risk of a Banking Network"

12:15 pm - 1:00 pm

Robert ENGLE (NYU Stern)
"Measuring Systemic Risk with Dynamic Conditional Beta"

1:00 pm - 1:15 pm *Lunch Address*

Rémy LAMBINET (GRI in Financial Services - Toronto)

1:15 pm - 2:15 pm *Lunch*

2:15 pm - 2:30 pm **Serge DAROLLES** (U. of Paris-Dauphine)

Introduction of the House of Finance

Chair: **Rémy LAMBINET** (GRI in Financial Services - Toronto)

2:30 pm - 3:00 pm **Christophe PERIGNON** (HEC Paris)

"Where the Risks Lie: A Survey on Systemic Risk"

3:00 pm - 3:30 pm **Jón DANIELSSON** (London School of Economics)

"On the Nature of Financial Risk. Why Risk is so Hard to Measure and Why Risk Models Fail so Often"

3:30 pm - 4:00 pm **Rama CONT** (Imperial College London)

"Endogenous Risk and Price-mediated Contagion: Modeling, Monitoring and Regulation"

4:00 pm - 4:15 pm *Tea Break*

Special 2015 Session on "Networks" – Chair: Bertrand MAILLET (U. of Paris-Dauphine)

4:15 pm - 4:45 pm **Christian BROWNLEES** (Pompeu Fabra U.)

"Bank Credit Risk Networks: Evidence from the Eurozone"

4:45 pm - 5:15 pm **Mila GETMANSKY SHERMAN** (U. of Massachusetts, Amherst)

"Sovereign, Bank and Insurance Credit Spreads: Connectedness and System Networks"

5:15 pm - 5:45 pm **Thomas HURD** (McMaster University)

"Contagion! The Spread of Systemic Risk in Financial Networks"

5:45 pm - 6:00 pm *End of workshop address*

Hervé QUENEAU (Brooklyn College, CUNY), **Philippe BERNARD** (U. of Paris-Dauphine)