

Guillaume Roussellet

Main Affiliation

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RESEARCH INTERESTS

Yield curve modeling, asset and derivative pricing, financial econometrics, non-linear filtering and factor models, monetary policy and macrofinance.

APPOINTMENT

Aug. 2017 - **McGill University, Desautels Faculty of Management**, Montréal, Canada
• *Assistant Professor*

ACADEMIC POSITIONS

2015 - 2017 **NYU Stern School of Business - Volatility Institute**, New York, U.S.
• *Post-doctoral researcher*
Job Market Committee: Robert F. ENGLE (postdoc supervisor), Alain MONFORT, Olivier SCAILLET, Andrew PATTON.

EDUCATION

Spring 2015 **NYU Stern School of Business - Economics department**, New York, U.S.
• *Visiting Scholar*
Sponsor - David BACKUS

2012 - 2015 **University Paris-Dauphine, CREST, and Banque de France**, Paris, France
• *Ph.D. in Applied Mathematics (Econometrics)*
Dissertation: “*Non-Negativity and Zero Lower Bound in Affine Yield Curve Models*”
Committee: Alain MONFORT (supervisor), Christian GOURIÉROUX, Éric RENAULT, Olivier SCAILLET, Nour MEDDAHI, Serge DAROLLES.

2011 - 2012 **Paris School of Economics**, Paris, France
• *M.Sc in Economics*

2009 - 2012 **ENSAE - Paristech**, Malakoff, France
• *B.Sc, M.Sc in Economics, Statistics and Econometrics*

2007 - 2009 **Lycée Lakanal**, Sceaux, France
• *Classes Préparatoires - Humanities and Social Sciences (B/L)*

PROFESSIONAL AND RESEARCH EXPERIENCE

- Summer 2012 **Banque de France**, Paris, France
- *Intern in yield curve modeling*
- Summer 2011 **CEPII research center**, Paris, France
- *Research assistant: Assessing Fiscal Sustainability in the Presence of Systemic Banks*
- Summer 2010 **French Treasury Department, Ministry of Finance**, Paris, France
- *Intern in forecasting aggregate dividends in national accounts*

PUBLISHED WORKS

[Staying at Zero with Affine Processes: An Application to Term Structure Modeling](#)

(with Alain MONFORT, Fulvio PEGORARO and Jean-Paul RENNE),

► *Forthcoming in the Journal of Econometrics*

- *Abstract:* We build an Affine Term Structure Model that provides non-negative yields at any maturity and that is able to accommodate a short-term rate that stays at the zero lower bound (ZLB) for extended periods of time while longer-term rates feature high volatilities. We introduce these features through a new univariate non-negative affine process called ARG-Zero, and its multivariate affine counterpart (VARG), entailing conditional distributions with zero-point masses. The affine property of this new class of processes implies both explicit bond pricing and quasi-explicit lift-off probability formulas. We provide an empirical application to Japanese Government Bond (JGB) yields, observed weekly from June 1995 to May 2014 with maturities from six months to ten years. Our four-factor specification is able to closely match yield levels and to capture conditional yield variances.

[A Quadratic Kalman Filter \[\\[code\\]\]\(#\)](#) (with Alain MONFORT and Jean-Paul RENNE),

► *Journal of Econometrics - Volume 187, Issue 1, July 2015, Pages 43–56.*

- *Abstract:* We propose a new filtering and smoothing technique for non-linear state-space models. Observed variables are quadratic functions of latent factors following a Gaussian VAR. Stacking the vector of factors with its vectorized outer-product, we form an augmented state vector whose first two conditional moments are known in closed-form. We also provide analytical formulae for the unconditional moments of this augmented vector. Our new Quadratic Kalman Filter (QKF) exploits these properties to formulate fast and simple filtering and smoothing algorithms. A simulation study first emphasizes that the QKF outperforms the extended and unscented approaches in the filtering exercise showing up to 70% RMSEs improvement of filtered values. Second, it provides evidence that QKF-based maximum-likelihood estimates of model parameters always possess lower bias or lower RMSEs than the alternative estimators.

[Scenario Generation For Long-Run Interest Rate Risk Assessment](#) (with Robert ENGLE and Emil SIRIWARDANE)

► *Forthcoming in the Journal of Econometrics.*

- *Abstract:* We propose a statistical model of the term structure of sovereign yields tailored for long-term probability-based scenario generation and forecasts. While being simple to estimate, our model is able to reproduce simultaneously the positivity of the yield curve, high persistence, factor structure and time varying volatilities and correlations. It features a regime switching short rate model. A complete benchmark of the model following Diebold and Li is performed in terms of forecasting ability and coverage properties. We show that the proposed model improves performance relative to a standard model from the literature.

Credit and Liquidity in Interbank Rates: A Quadratic Approach (with Simon DUBECQ, Alain MONFORT and Jean-Paul RENNE),

► *Journal of Banking and Finance - Volume 68, July 2016, Pages 29-46.*

- *Abstract:* A bank that lends on the unsecured market requires compensations for facing the default risk of the borrowing bank (credit risk) and the risk associated to its own future funding needs (liquidity risk). In this paper, we propose a quadratic term-structure model of the spreads between unsecured and risk-free interbank rates. Our no-arbitrage econometric framework allows us to decompose the term structure of spreads into credit and liquidity components and to identify risk premia associated with each of these two risks. Our results suggest that, over the period 2012–2013, most of the reduction in interbank spreads comes from a decrease in liquidity-related risk components.

Fiscal Sustainability in the Presence of Systemic Banks: The Case of EU Countries

(with Agnès BÉNASSY-QUÉRÉ),

► *International Tax and Public Finance - Volume 21, Issue 3, June 2014, Pages 436-467.*

- *Abstract:* We provide a first attempt to include an off-balance sheet, implicit insurance to SIFIs into a consistent assessment of fiscal sustainability, for 27 countries of the European Union. We first calculate tax gaps à la Blanchard (OECD Economics Department Working Papers, No 79, 1990) and Blanchard et al. (Revue économique de l'OCDE, 1990). We then introduce two alternative measures of implicit off-balance sheet liabilities related to the risk of a systemic bank crisis. The first one relies on microeconomic data at the bank level. The second one is based on econometric estimations of the probability and the cost of a systemic banking crisis. The former approach provides an upper evaluation of the fiscal cost of systemic banking crises, whereas the latter one provides a lower one. Hence, we believe that the combined use of these two methodologies helps to gauge the range of fiscal risk.

WORKING PAPERS

Affine Term Structure Modeling and Macroeconomic Risks at the Zero Lower Bound

- *Abstract:* We propose the first affine pricing model capturing the joint dynamics of macroeconomic variables and the yield curve while being consistent with the zero lower bound. Our model-implied short-rate distribution has a probability-mass at its lower bound and depends on quadratic combinations of Gaussian macroeconomic and yield-specific factors. With a standard pricing kernel, interest rates and their forecasts are closed-form functions of the macroeconomy. Our empirics investigate the pricing of inflation risks in nominal U.S. rates. We show that the recent crisis triggers substantial short-term deflation fears, so keeping interest rates low is beneficial for the macroeconomy and investors' utility.

Affine Modeling of Credit Risk, Credit Event and Contagion (with Alain MONFORT, Fulvio PEGORARO and Jean-Paul RENNE),

- *Abstract:* We propose a new discrete-time affine pricing model for defaultable securities breaking down the most restrictive assumptions made in the existing frameworks. Building on the recently introduced non-negative Gamma-zero distribution entailing a point mass at zero, our model simultaneously allows for (i) the presence of systemic entities by not imposing the no-jump condition on the factors' conditional distribution, (ii) contagion effects between defaultable entities, (iii) the pricing of credit events and (iv) the presence of stochastic recovery rates. The main advantage of our framework is its ability to relax simultaneously several restrictive assumptions made in the existing models while staying in the affine class, thus delivering explicit pricing formulas for default-sensitive securities like bonds and credit default swaps. A first application shows how this framework can be exploited to estimate sovereign credit risk premiums in a parsimonious endowment-economy. In a second application, we jointly model term structures of sovereign CDS denominated in different currencies and extract market-implied probabilities of depreciations at default. A third application illustrates the ability of the model to replicate the behavior of banks' CDS spreads that was observed in the aftermath of the Lehman Brothers' bankruptcy.

WORK IN PROGRESS

Hedge Fund Portfolio Management with Illiquid Assets (with Serge DAROLLES),

► *Work in progress.*

SEMINAR AND CONFERENCE PRESENTATIONS

2017 *Conferences* - SCE - computing in Economics and Finance, Computational and Financial Econometrics Conference (CFE, *scheduled*), Bundesbank term structure workshop (*scheduled*).

Seminars - McGill University, University of Montréal, Chicago Booth, New York Federal Reserve, Toulouse School of Economics, Copenhagen Business School, Aarhus University, Warwick Business School, Tilburg University, Erasmus University, European Central Bank.

2016 *Conferences* - 9th Annual Conference of the Society for Financial Econometrics (SOFIE), Barcelona Graduate School of Economics Time-Series workshop, 69th European Summer Meeting of the Econometric Society (ESEM), 3rd European Econometric Society Winter Meeting.

Seminars - Bank of Canada, Laval University, NYU Stern (QFE).

2015 *Conferences* - North American Winter Meeting of the Econometric Society (NAWM), 7th Annual Conference of the Volatility Institute, World Congress of the Econometric Society (ESWC), Banque de France workshop on *Modeling the term structure at the ZLB*, Computational and Financial Econometrics Conference (CFE).

Seminars - Brown University, CREST, Banque de France.

- 2014 *Conferences* - 7th International Risk Forum on Big Data, 31st Spring International Conference of the French Finance Association (AFFI), 7th Annual Conference of the Society for Financial Econometrics (SOFIE), 20th International Conference on Computing in Economics and Finance (CEF), 1st Conference of the International Association for Applied Econometrics (IAAE), 21st International Conference on Computational Statistics (COMPSTAT), 29th European Summer Meeting of the Econometric Society (ESEM).
Seminars - Banque de France Seminar, University of Lugano, Bank of Canada, University of Geneva.
- 2013 *Conferences* - 6th International Risk Forum on Liquidity Risk, French Association of Economics Conference (AFSE), 30th Spring International Conference of the French Finance Association (AFFI), European Central Bank Workshop on Non-conventional Monetary Policy, North-American Summer Meeting of the Econometric Society (NASM), 28th European Summer Meeting of the Econometric Society (ESEM), Computational and Financial Econometrics Conference (CFE).
Seminars - Banque de France.

DISCUSSIONS IN ACADEMIC CONFERENCES

- 2017 Financial Management Association (FMA, *scheduled*)
- 2017 Northern Finance Association (NFA, *scheduled*)
- 2016 European Finance Association (EFA)
▶ *Assessment of Uncertainty in High Frequency Data: the Observed Asymptotic Variance* by MYKLAND and ZHANG – [\[slides\]](#)
- 2015 Banque de France Workshop on *Term Structure Modeling and the Zero Lower Bound*
▶ *Term Structure Modeling when Monetary Policy is Unconventional: A New Approach* by FEUNOU, FONTAINE and LE – [\[slides\]](#)
- 2014 31th Spring International Conference of the French Finance Association (AFFI)
- 2013 30th Spring International Conference of the French Finance Association (AFFI)

REFeree ACTIVITY

Journal of Financial Econometrics, Economics Letters, Journal of Banking and Finance.

GRANTS AND AWARDS

- 2015 2-year NYU-Stern Volatility Institute fellowship
- 2012 3-year Banque de France Fellowship
- 2012 CREST Fellowship

TEACHING

2013 - 2015	Portfolio Management, MBA – Université Dauphine, Bärchen
2013 - 2015	Financial Econometrics, Graduate (TA) – ENSAE-Paristech
2013 - 2015	Time Series Econometrics, Graduate (TA) – ENSAE-Paristech
2012 - 2013	Macroeconomics, Undergraduate (TA) – Paris I Sorbonne University

LANGUAGES AND SKILLS

Languages	French (native), English (fluent), German (intermediate), Chinese (notions).
Computer	C++, R, Scilab, Matlab, Stata, Eviews, SAS, Mathematica, Python, MS Office, L ^A T _E X

PERSONAL INTERESTS

Music (20 years of trumpet in Conservatory and orchestra/big band), Swing dancing, History, Classical Literature, Sports, Travel.

Last update: June, 2017