

# CURRICULUM VITAE: PAULINE BARRIEU

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**Current employment:** Professor in Statistics, Department of Statistics, London School of Economics and Political Science.

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## **Education**

- 2005 Qualification as an Actuary from l'Institut des Actuaire Français.  
2004 Qualification in France as "maitre de conferences" in Finance and in Mathematics.  
2002 PhD in Applied Mathematics with highest honours, laboratoire de Probabilités et Modèles aléatoires, University of Paris VI (France) (supervisor: Nicole El Karoui).  
2002 PhD in Finance with highest honours, Doctorat H.E.C. (France), H.E.C. Graduate Business School (supervisor: Marc Chesney).  
1998-1999 Graduated from the Doctorat H.E.C. specialization certificate, with highest honours.  
Postgraduate diploma in Economics: "DEA Analyse et politique économiques", E.H.E.S.S., as a free student.  
1997-1998 Postgraduate diploma in Probability: "DEA Probabilités et Applications Option Finance", University Paris VI, with honours.  
1994-1997 Graduated from E.S.S.E.C., Graduate business school.

## **Present and Previous Employment**

### **LSE**

- 2002-2005 Lecturer, Statistics department.  
2002-2012 Reader, Statistics department (tenure obtained in 2005).  
Feb-May Maternity leave.  
2011  
2012-present Professor, Statistics department

## **Prior to LSE**

1998-2000      Class teacher, Université d'Evry (Mathematics department).  
2000-2001      Visiting lecturer, ESSEC (Finance department).  
2001-2002      Visiting lecturer, HEC (Finance department).

## **Visiting Appointments**

2008-2011      Visiting Professor, HEC (Finance department).

## **Administrative Duties**

2002-              Liaison Officer with the Institute of Actuaries.  
present  
2006-              Liaison Officer of the London Graduate School in Mathematical Finance with the  
present              Statistics department.  
2006-              Member of the LSE Research Degree Sub-Committee.  
present  
2006-              PhD programme director, Statistics Department.  
present  
2006-              Member of the Statistics Research Committee.  
present

## **Contributions To School Research Centres**

2007-              Co-director of Centre for the Analysis of Time Series (CATS).  
present  
2008-              Joint work-package leader, Centre for Climate Change Economics and Policy  
present              (CCCEP).  
2008-              Associate staff member, Grantham Research Institute on Climate Change and the  
present              Environment.

## **Professional Activities and Consultancies**

2010-              Principal examiner for the Institute of Actuaries.  
present  
2011              Member of the Accreditation panel of the Institute of Actuaries.  
2012              Member of the Scientific Committee of Climate Change Partners.  
2012              Member of the Scientific Committee of the SCOR Foundation.

## **Journal Editing and Editorial Board Membership**

2009-              Associate Editor of Stochastic Processes and their Applications.  
present  
2012-              Associate Editor of International Journal of Financial Studies.  
present  
2013-              Associate Editor of Bernoulli  
present

## **External Examining Experience**

2009-2011 External Examiner for Queen University Belfast.

## **Honours and Prizes**

- 2003 Prize for the best Actuarial PhD dissertation (Prix Actuariat 2003).
- 2006 Award for the best research paper in quantitative finance, Europlace Institute of Finance: “Inf-convolution of risk measures and optimal risk transfer” (with N. El Karoui) published in *Finance and Stochastics* in 2005.
- 2006 Award for the best research paper “Finance and sustainable development”, European Union (Responsible Investment Forum): “On precautionary policies” (with B. Sinclair Desgagné) published in *Management Science* in 2006.

## **Published Work And Work In Press**

### **Books**

1. “The Handbook of Insurance-Linked Securities” (co-edited by Luca Albertini), published by Wiley (July 2009).

### **Articles in Refereed Journals**

1. “Reinsurance and securitisation in life insurance risk: the impact of regulatory constraints” with H. Loubergé. To appear in *Insurance: Mathematics and Economics*.
2. “Indifference pricing with uncertainty averse preferences” with F. Giammarino. To appear in *Journal of Mathematical Economics*.
3. “Monotone stability of quadratic semimartingales with applications to general unbounded quadratic BSDEs” with N. El Karoui. To appear in *Annals of Probability*.
4. “Assessing of the costs of protection in a context of switching stochastic regimes stochastic regimes” with N. Bellamy and J.M. Sahut. To appear in *Applied Mathematical Finance*.
5. “Understanding, modeling and managing longevity risk: aims and scope” with H. Bensusan, N. El Karoui, C. Hillairet, S. Loisel, C. Ravanelli and Y. Sahli. To appear in *Scandinavian Actuarial Journal*.
6. “Non-linear mixture of asset return models” with S. Tobelem. *Risk Magazine*, p.74-79 (July 2012).
7. “An adaptive nonparametric model for the systematic factors of portfolio credit risk premia” with F. Giammarino. *Journal of Empirical Finance*, Vol. 16, p. 655-670 (2009).
8. “Hybrid Cat-bonds” with H. Loubergé. *Journal of Risk and Insurance*, Vol. 76, p. 547-578 (2009).
9. “Robust asset allocation under model risk” with S. Tobelem. *Risk Magazine*, p. 91-95 (February 2009). Republished in *Life and Pensions*, p. 36-40 (May 2009).
10. “Closedness results for BMO semi-martingales and application to quadratic BSDEs ” with N. Cazanave and N. El Karoui. *Comptes Rendus de l'Academie des Sciences*, Vol. 346, p. 881-886 (2008).
11. “On Pareto-optimal allocations for multi-period risks” with G. Scandolo. *ASTIN Bulletin*, Vol. 38, p. 105-136 (2008).
12. “Flood insurance in the Netherlands” with R. Jongejan. *Geneva Papers on Risk and*

- Insurance*, Vol. 33, p. 250-268 (2008).
13. "Optimal hitting time and perpetual option in a non-Levy model: Application to real options" with N. Bellamy. *Advances in Applied Probability*, Vol. 39, p. 1-20 (2007).
  14. "On precautionary policies" with B. Sinclair Desgagné. *Management Science*, Vol. 52, nb 8, p.1145-1154 (2006).
  15. "Iterates of the infinitesimal generators and generalized Stirling numbers associated with certain subordinators" with W. Schoutens. *Journal of Computational and Applied Mathematics*, Vol. 186, p. 300-323 (2006).
  16. "Inf-convolution of risk measures and optimal risk transfer" with N. El Karoui. *Finance and Stochastics*, Vol. 9, nb 2, p. 269-298 (2005).
  17. "Optimal risk transfer" with N. El Karoui. *Finance*, Vol. 25, p. 31-47 (2004).
  18. "A study of the Hartman-Watson distribution motivated by numerical problems related to Asian options pricing" with A. Rouault and M. Yor. *Journal of Applied Probability*, Vol. 41 nb 4, p. 1049-1058 (2004).
  19. "Optimal derivatives design under dynamic risk measures" with N. El Karoui. Article in *Mathematics of Finance, Contemporary Mathematics (A.M.S. Proceedings)*, p. 13-26 (2004).
  20. "Introduction aux produits dérivés climatiques". *Journal de la Société Française de Statistique* Vol. 144, nb 3, p. 53-68 (2003).
  21. "Optimal timing for an environmental policy in a strategic framework" with M. Chesney. *Environmental Modeling and Assessment*, Vol. 8, p. 149-163 (2003).
  22. "Structuration optimale de produits dérivés et diversification en présence de sources de risque non-négociables" with N. El Karoui. *Comptes Rendus de l'Académie des Sciences*, Vol. 336, nb. 6, p. 493-498 (2003).
  23. "Reinsuring climatic risk using optimally designed weather bonds" with N. El Karoui. *Geneva Papers – Risk and Insurance Theory*, Vol. 27, p. 87-113 (2002).
  24. "Optimal design of weather derivatives" with N. El Karoui. *Algo Research Quarterly*, Vol. 5, n°1, p. 79-92 (spring 2002).
  25. "Optimal design of derivatives in illiquid framework" with N. El Karoui. *Quantitative Finance*, Vol. 2, p. 1-8 (2002).
  26. "Weather hedging at the Hot Air Gas Company" with R. Dischel. *Electronic Journal: Derivativesreview.com* (July 2001).

## Refereed Chapters

1. "Innovations in insurance markets: hybrid and securitized risk-transfer solutions" with D. Cummins. In: *The Handbook of Insurance*, Second Edition (ed: G. Dionne). Springer Verlag (2013).
2. "Robust asset allocation under model risk" with S. Tobelem. In: *Alternative Investments and Strategies* (eds: Rudiger Kiesel, Matthias Scherer and Rudi Zagst). World Scientific (2010).
3. "Asset allocation under model risk" with S. Tobelem. In: *The Risk Modeling Evaluation Handbook* (eds: Greg N. Gregoriou, Christian Hoppe and Carsten S. When) MacGraw-Hill (2010).
4. "Weather derivatives" with O. Scaillet. In: *Encyclopedia for Quantitative Finance*. Wiley (2010).
5. "Securitisation". In: *Encyclopedia for Quantitative Finance*. Wiley (2010).
6. "A primer on weather derivatives" with O. Scaillet. In: *Handbook on Uncertainty and Environmental Decision Making* (eds: Jerzy Filar and Alain Haurie). Springer International Series in Operations Research and Management science (2009).
7. "Pricing, hedging and optimally designing derivatives via minimization of risk measures" with N. El Karoui. In *Volume on Indifference Pricing* (ed: Rene Carmona), Princeton University Press (2009).
8. "Dynamic Financial Risk Management" with N. El Karoui. In: *Aspects of Mathematical*

- Finance* (ed: Marc Yor), Springer Verlag (2008).
9. “Dynamic Financial Risk Management” with N. El Karoui. In: *Aspects des mathématiques financières*, Institut de France, Académie des Sciences, Editions Tec & Doc (2006).
  10. “Impact of a market crisis on real options” with N. Bellamy. In: *Exotic Option Pricing and Advanced Levy Models* (eds: Andreas Kyprianou, Wim Schoutens and Paul Wilmott), Wiley Finance (2005).
  11. “Gestion du risque climatique à l’aide de contrats financiers: l’expérience Américaine” with R. Dischel, in “*La réassurance: Approche technique*”, Economica (2003).
  12. “Fundamentals of weather Financial contracts, what protection they provide, and strategies for their use” with R. Dischel, in “*The Perpetually Evolving Climate: variability, adverse weather and climate risk management*”, Risk Book, Risk Waters Group (2002).

### **Others**

1. “Risk, Reward and Realism: Climate Science, Models and Informed Risk Trading” (with L. Smith), *Trading Risk* (April 2010).

### **Work Submitted For Publication**

#### **Articles in Refereed Journals**

1. “Economic Policy when Models Disagree” with B. Sinclair Desgagné.
2. “A new methodology for asset allocation under model risk” with S. Tobelem.
3. “Integrated EUA and CER price modeling and application for spread option pricing” with M. Fehr.
4. “Sensitivity of Stochastic Delay Differential Equations with respect to the time lag” with N. Bellamy and E. Buckwar.

### **Working Papers (work in progress)**

1. “Assessing cleanup costs” with N. Bellamy and B. Sinclair Desgagné.
2. “Assessing model risk” with G. Scandolo.
3. “Sensitivity of cat-bond pricing to model uncertainty” with F. Niehoerster and N. Ranger.
4. “Impact of model uncertainty on longevity risk transfer” with L. Veraart.

### **Past Research Grants**

#### **As Principal Investigator:**

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|-----------|--|
| 1998-2002 | PhD funded by the French Government (Allocation de Recherche).   |
| 2003-2005 | EPSRC Travel Grant “Measures of Risk and Uncertainty at the Interface of Insurance and Finance” (£8,500).  |
| 2006      | Amamef Exchange Grant “Risk measurement and robust statistics” (€775).   |
| 2006-2008 | British Academy Grant “Stochastic Delay Differential Equations: Robustness and Portfolio Optimization” (£5,700).                                     |
| 2007      | British Academy Grant for the organization of a conference “Risk and Stochastics Day 2007” (£1,600).   |
| 2007-2008 | London Development Agency Grant “Future Developments in the Credit Risk Market” (£8,000)   |
| 2008-2010 | Columbia-LSE Alliance Collaborative Research Fund “Credit derivatives and structured credit products: issues in pricing and optimal design” (£5000). |

2013 STICERD grant for the visit by Giacomo Scandolo (£6000).

As Co-Investigator:

- 2007-2011 EPSRC “Mathematical Sciences Integrated PhD” for the creation of the London Graduate Taught Course Centre in Mathematical Sciences (LTCC) (£450,646). (PIs Frank Smith and Shaun Bullett).
- 2008-2013 ESRC Centre for Climate Change Economics and Policy, project WP4 “Carbon Finance: Society, Technology, Market” (Total funding for the Centre: £4.5m. (PIs Judith Rees & Andrew Gouldson).
- 2008-2013 Munich Re “Evaluating the economics of climate risks and opportunities in the insurance sector”, project 5a “Evidence of current economic reaction and future financial products” (Total funding of £3m). (PI Leonard Smith).
- 2008-2012 EC FP7 People IAPP “Climate Change and the Insurance Industry” (€922,535). (PIs Henry Wynn and Arnaldo Frigessi).

**Conferences Organised in the Last 5 Years**

- 2006 . London Graduate School in Mathematical Finance, PhD Day (London, UK).
- 2007 . Mini-symposium on Environmental Economics and Stochastics in the ICIAM Conference (Zurich, Switzerland).
- . Risk and Stochastics Day 2007 (London, UK).
- . London Graduate School in Mathematical Finance, PhD Day (London, UK).
- 2008 . London Graduate School in Mathematical Finance, PhD Day (London, UK).
- 2009 . Special lecture for the Worshipful Company of Actuaries, LSE (London, UK).
- . London Graduate School in Mathematical Finance, PhD Day (London, UK).
- 2010 . Special lecture for the Worshipful Company of Actuaries, LSE (London, UK).
- . London Graduate School in Mathematical Finance, PhD Day (London, UK).
- . Two sessions in the 'Energy and Emission Markets' stream of the EURO XXIV (24th European Conference on Operational Research) (Lisbon, Portugal).
- 2011 . Longevity and Pension Funds Conference (Paris, France).
- 2012 . Workshop on Uncertainty Quantification, Risk and Decision (London, UK).

**Conference Papers Given in the Last 5 Years**

- 2006 . 4<sup>th</sup> International Financial Research Forum, Europlace Institute of Finance (Paris, France).
- . 4<sup>th</sup> Bachelier conference (Tokyo, Japan).
- . Workshop on Credit risk modeling, ICMS (Edinburgh, UK).
- . Conference “Helping the invisible hand” in honour of Professor Claude Henry, Ecole Polytechnique (Paris, France).
- 2007 . SCOR-JRI Conference on New Forms of Risk Sharing (Paris, France).
- 2008 . Actuarial and Financial Mathematics Conference (Brussels, Belgium).

**Guest Lectures and Plenary Talks Given in the Last 5 Years**

- 2006
  - Joint econometrics and statistics workshop, LSE (London, UK).
  - Seminar at the mathematics department, Evry University (Evry, France).
  - Workshop on Climate change, CIRANO (Montreal, Canada).
  - DGVFM Meeting, yearly assembly of the German Actuaries (Cologne, Germany).
  - Seminar at Nice University (laboratoire Dieudonné) and INRIA (Nice, France).
  - Seminar at Princeton University (Princeton, USA).
  - Colloquium “Les risques industriels, environnementaux et financiers”, organized by the French Statistical Society in Clamart (France).
  - 31<sup>st</sup> Conference on Stochastic Processes and their Applications (Paris, France).
  - Workshop on Securitization of weather and climate risks, Humboldt University (Berlin, Germany).
  - Seminar at Cass Business School (London, UK).
  - Workshop on New actuarial topics in longevity and transfer of risks, University of Louvain La Neuve (Louvain, Belgium).
- 2007
  - Workshop Risk metrics and modelling with applications (Eurandom, Eindhoven, The Netherlands).
  - German Association for Insurance and Financial Mathematics (DGVFM), Scientific Conference (Berlin, Germany).
  - Workshop on Mathematics and the Environment: Energy Risk, Environmental Uncertainty and Public Decision Making (Banff, BIRS center, Canada).
  - Seminar in the mathematics department, ETH (Zurich, Switzerland).
  - Workshop on Economic Capital and Diversification effect at Group Level (Lyon, France).
  - Marcus Evans Conference on Life Insurance Securitization (London, UK).
- 2008
  - Workshop on Prospective mortality tables, longevity and mortality linked securities (Paris, France).
  - Financial stability seminar at the Bank of England (London, UK).
  - Marcus Evans Conference on Life Insurance Securitization (London, UK).
  - AXA Mastery, guest lecture on Insurance Linked Securitization (Bordeaux, France).
- 2009
  - AXA Mastery, guest lecture on Insurance Linked Securitization (Bordeaux, France).
  - Seminar in the economics department, University of Geneva (Geneva, Switzerland).
  - Conference from the German and Austrian mathematical societies (Graz, Austria).
- 2010
  - IPQ Conference on Insurance-Linked Securitisation (New-York, USA).
  - Winter School on Mathematical Finance (Lunteren, The Netherlands).
  - Risk and Stochastics Day (London, UK).
  - Workshop on Carbon Markets as part of the conference "Chaire Finance et Developements Durables" (Paris, France).
  - IMS conference (Gothenburg, Sweden).
- 2012
  - Oberwolfach workshop on The Mathematics and Statistics of Quantitative Risk Management (Oberwolfach, Germany).

### **Current Invitations as Keynote Speaker**

- June
  - Amamef and Banach Center Conference on Advances in Mathematics of Finance.
- 2013
  - AFIR-ERM Colloquium.

July · IME Conference.  
2013

### **Experience of Research Student Supervision**

#### **LSE**

Sandrine Tobelem, PhD, who graduated in July 2011.

Flavia Giammarino, PhD, who graduated in July 2012.

#### **Co-supervision outside of the LSE**

Alexandre Mornet, PhD (joint supervision with Stéphane Loisel, Université de Lyon, France).