ALEXANDRE BOUMEZOUED

PHD

Principal

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Current Responsibility

Alexandre Boumezoued is Principal and Research & Development Director in Milliman's Paris office.

Professional Designations

Professional Fellow of Louis Bachelier Institute

Professional Work Experience

Alexandre has led the development of scientific solutions and consulting services over a range of different risk modelling areas, including Economic Scenarios Generators (ESG), asset-related risks, mortality and policyholder behavior, and Economic Capital Models. He has led the expansion of ESG services with the Milliman Economic Scenario Generator (Best ESG Software by Insurance ERM).

He has worked on the following Economic Capital Model projects:

- Review and proposals for improvement of the equity risk premium model
- Review and implementation of improvements of the sovereign spread risk model
- Design of the economic capital model for spread and default risks, including the Dynamic Volatility Adjustment methodology, and their aggregation
- Improvement of the Least Square Monte Carlo proxy model validation
- Production of benchmark estimates of Internal Model outcomes (market and life risks) for Internal Model and Standard Formula companies
- Review and improvement of the mortality, longevity, and pandemic risk models
- Review and improvement of the aggregation methodology within different Internal Models
- Implementation of a number of improved models for life and financial risks
- Review and improvement of the stochastic inflation modelling within the P&C Internal Model for premium and reserve risks

- Validation of the reinsurance counterparty default risk and the aggregation methodology for a Partial Internal Model
- Review and validation of the market risks modelling and the Nested Simulations Methodology of an Internal Model
- Review of the solvency ratio projection process

His consulting experience on ESGs includes:

- Implementation and validation of ESGs (Risk Neutral and Real World)
- Support to the justification of ESG-embedded parameters to auditors and regulators
- Improvement of operational and compliance processes for economic scenarios production
- Enhancement of data quality used for ESG calibration
- Support for model choices and development

He has worked on the following projects related to mortality modeling:

- Enhancing the data quality for general population mortality estimates
- Modelling the impact of heat waves on mortality
- Implementing SIRD-type models for pandemic severity forecasting
- Implementing a number of improved models for longevity, mortality, and mortality CAT risks
- Retreating pandemic mortality within mortality series and other historical patterns
- Analysing cause-of-death mortality differentials by socio-economic groups for the Society of Actuaries
- Reviewing frequency and severity components of a pandemic model, including the spread mechanisms within the spatial model, analysis of model sensitivity, and proposal of modeling simplifications
- Deriving mortality and longevity scenarios for updating Best Estimate assumptions used in insurance valuation and risk transfer

As part of his scientific activity, Alexandre is lecturer in actuarial centers in France, and referee for scientific journals.

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Education

- Engineer (*Ecole Nationale des Ponts et Chaussées*)
- MSc in Probability Theory (Paris 6 University)
- PhD in Applied Mathematics (Probability and Random Models Laboratory, Paris 6 University)

Presentations and Publications

Publications

Boumezoued, A., Cherkaoui, Y., & Hillairet, C. 2023. Cyber risk modeling using a two-phase Hawkes process with external excitation.

Andres, H., Bourmezoued, A., & Jourdain, B. 2022. Signature-based validation of real-world economic scenarios.

Boumezoued, A. 2021. Discussion on paper "Shapovalov et al (2021), Exchangeable mortality projection." European Actuarial Journal.

Boumezoued, A. & Lecoeur, E. 2021. Actuarial R&D – why do it, and how? The Actuary, April 2021.

Boumezoued, A. & Robert, C. 2020. Individual claim reserving models: parametric vs non-parametric models. In the book: Insurance Data Analytics.

Boumezoued, A. & Elfassihi, A. 2020. Mortality data correction in the absence of monthly fertility records. Insurance: Mathematics and Economics.

Boumezoued, A., & Lecoeur, E. 2020. Existence et conscience de la R&D Actuarielle. L'Actuariel no 30, Octobre, 2020.

Andres, H., Arrouy, P.E., Bonnefoy, P., Boumezoued, A., & Mehalla, S. 2020. Fast calibration of the LIBOR Market Model with Stochastic Volatility based on analytical gradient.

COVID-19 outbreak: what can actuaries learn about mortality? 2020. The European Actuary.

Arrouy, P. E., Boumezoued, A., Lapeyre, B., & Mehalla, S. 2022. Jacobi stochastic volatility factor for the LIBOR market model. Finance and Stochastics, 26(4), 771-823.

Bessy-Roland, Y., Boumezoued, A., & Hillairet, C. 2021. Multivariate Hawkes process for cyber insurance. Annals of Actuarial Science, 15(1), 14-39.

Boumezoued, A., Hoffmann, M., & Jeunesse, P. 2021. Nonparametric adaptive inference of birth and death models in a large population limit. Mathematical Staticstics and Learning, 3(1), 1-69.

Boumezoued, A., Hoffmann, M., & Jeunesse, P. 2018. A new inference strategy for general population mortality tables. ASTIN Bulletin. https://hal.archives-ouvertes.fr/hal-017773665.

Balland, F., Boumezoued, A., Devineau, L., Habart, M., & Popa, T. 2018. Mortality data reliability in an internal model. Annals of Actuarial Science.

Devineau, L., Arrouy, P.E., Bonnefoy, P., & Boumezoued, A. 2017. Fast calibration of the LIBOR Market Model with Stochastic Volatility and Displaced Diffusion. Journal of Industrial and Management Optimization.

Boumezoued, A. & Devineau, L. 2017. Individual claims reserving: a survey.

Boumezoued, A. 2016. Population viewpoint on Hawkes processes. Advances in Applied Probability, Volume 48, Pages 1-18.

Boumezoued, A. 2016. Improving HMD mortality estimates with HFD fertility data. North American Actuarial Journal.

Arnold, S., Boumezoued, A., Labit Hardy, H., & El Karoui, N. 2016. Cause-of-Death Mortality: What Can Be Learned From Population Dynamics?. Insurance: Mathematics and Economics (Longevity 11 Special Issue).

Boumezoued, A., El Karoui, N., & Loisel, S. 2015. Measuring mortality heterogeneity dynamics with internal-censored data. Insurance: Mathematics and Economics. Volume 72, January 2017, Pages 67-82.

Boumezoued, A. 2016. Micro-macro analysis of heterogenous age-structured populations dynamics. Application to self-exciting processes and demography. Doctoral thesis.

Boumezoued, A. 2015. Macroscopic behavior of heterogenous populations with fast random life histories.

Boumezoued, A., Angoua, Y., Devineau, L., & Boisseau, J.P. 2011. One-year reserve risk including a tail factor: closed formula and bootstrap approaches.

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