

Sequential Monte Carlo Samplers for capital allocation under copula-dependent risk models

Rodrigo S. Targino¹, Gareth W. Peters¹, Pavel V. Shevchenko²

¹*University College London, London, UK*

²*CSIRO, Sydney, Australia*

Abstract

In this talk we assume a multivariate risk model has been developed for a portfolio and its capital derived as a homogeneous risk measure. The Euler (or gradient) principle, then, states that the capital to be allocated to each component of the portfolio has to be calculated as an expectation conditional to a rare event, which can be challenging to evaluate in practice. We exploit the copula-dependence within the portfolio risks to design a Sequential Monte Carlo Samplers based estimate to the marginal conditional expectations involved in the problem, showing its efficiency through a series of computational examples.

Keywords: Risk Management, Capital Allocation, Sequential Monte Carlo (SMC), Copula Models.

Speaker: Rodrigo S. Targino

Postal address: Office 103-A, 1-19 Torrington Place, London, WC1E 7HB, UK

e-mail: r.targino.12@ucl.ac.uk

Telephone number: +44 (0)77217 60137