

“Risk Model-at-Risk” ☆

Christophe M. Boucher^a, Jón Daniélsson^b, Patrick S. Kouontchou^c, Bertrand B. Maillet^{d,*}

^a*A.A.Advisors-QCG (ABN AMRO), Variances and Univ. Lorraine (CEREFIGE).*

^b*Systemic Risk Centre and London School of Economics.*

^c*Variances and Univ. Lorraine (CEREFIGE).*

^d*A.A.Advisors-QCG (ABN AMRO), Variances and Univ. of la Réunion (CEMOI and LBI).*

Abstract

The recent experience from the global financial crisis has raised serious doubts about the accuracy of standard risk measures as tools to quantify extreme downward risks. Risk measures are hence subject to a “model risk” due, e.g., to specification and estimation uncertainty. Therefore, regulators have proposed that financial institutions assess the “model risk” but, as yet, there is no accepted approach for computing such a risk. We propose a general framework to compute risk measures robust to the model risk, while focusing on the Value-at-Risk (VaR). The proposed procedure aims at empirically adjusting the imperfect quantile estimate based on a backtesting framework, assessing the good quality of VaR models such as the frequency, the independence and the magnitude of violations. We also provide a fair comparison between the main risk models using the same metric that corresponds to model risk required corrections.

Keywords: Model Risk, Value-at-Risk, Backtesting.

J.E.L. Classification: C50, G11, G32.

☆We thank Carol Alexander, Arie Gozluklu, Monica Billio, Thomas Breuer, Massimiliano Caporin, Rama Cont, Christophe Hurlin, Christophe Pérignon, Michaël Rockinger, Thierry Roncalli and Jean-Michel Zakoïan for suggestions when preparing this article, as well as Benjamin Hamidi for research assistance and joint collaborations on collateral subjects. The second author gratefully acknowledges the support of the Economic and Social Research Council (UK) [grant number: ES/K002309/1] and the fourth author the support of the Risk Foundation Chair Dauphine-ENSAE-Groupama “*Behavioral and Household Finance, Individual and Collective Risk Attitudes*” (Louis Bachelier Institute). Some extra materials related to this article can be found at: www.riskresearch.org. The usual disclaimer applies.

*Corresponding author: Pr. Bertrand B. Maillet, University of la Réunion, 15 avenue René Cassin - CS 92003 - 97744 Saint-Denis Cedex 1 France. Email: bertrand.maillet@gmail.com.

Email addresses: christophe.boucher@univ-lorraine.fr (Christophe M. Boucher), j.danielsson@lse.ac.uk (Jón Daniélsson), patrick.kouontchou@univ-lorraine.fr (Patrick S. Kouontchou), bertrand.maillet@gmail.com (Bertrand B. Maillet)