



SOCIETY OF ACTUARIES

Article from:

ARCH 2013.1 Proceedings

August 1- 4, 2012

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The Marginal Cost of Risk, Risk Measures, and Capital Allocation

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The Euler (or gradient) allocation technique defines a financial institution's marginal cost of a risk exposure via calculation of the gradient of a risk measure evaluated at the institution's current portfolio position. The technique, however, relies on an arbitrary selection of a risk measure. We reverse the sequence of this approach by calculating the marginal costs of risk exposures for a profit maximizing financial institution with risk averse counterparties, and then identifying a closed-form solution for the risk measure whose gradient delivers the correct marginal costs. We compare the properties of allocations derived in this manner to those obtained through application of the Euler technique to Expected Shortfall (ES), showing that ES generally yields economically inefficient allocations.