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On Representing and Hedging Claims for Coherent Risk Measures

We provide a dual characterisation of the weak*-closure of a finite sum of cones in L^{∞} adapted to a discrete time filtration \mathcal{F}_t : the t^{th} cone in the sum contains bounded random variables that are \mathcal{F}_t -measurable. Hence we obtain a generalisation of F. Delbaen's m-stability condition [*The structure of m-stable sets and in particular of the set of risk neutral measures*, in: In Memoriam Paul-André Meyer, Springer, Berlin et al. (2006) 215–258] for the problem of reserving in a collection of numéraires \mathbf{V} , called \mathbf{V} -m-stability, provided these cones arise from acceptance sets of a dynamic coherent measure of risk [see P. Artzner, F. Delbaen, J.-M. Eber, and D. Heath: *Thinking coherently*, Risk 10 (1997) 68–71; *Coherent measures of risk*, Math. Finance 9(3) (1999) 203–228]. We also prove that \mathbf{V} -m-stability is equivalent to time-consistency when reserving in portfolios of \mathbf{V} , which is of particular interest to insurers.

Keywords: Coherent risk measures, m-stability, time-consistency, Fatou property, reserving, hedging, representation, pricing mechanism, average value at risk.

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