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Risk assessment for uncertain cash flows: Model ambiguity, discounting ambiguity, and the role of bubbles

Beatrice Acciaio, Hans Foellmer, Irina Penner

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We study the risk assessment of uncertain cash flows in terms of dynamic convex risk measures for processes as introduced in Cheridito, Delbaen, and Kupper (2006). These risk measures take into account not only the amounts but also the timing of a cash flow. We discuss their robust representation in terms of suitably penalized probability measures on the optional sigma-field. This yields an explicit analysis both of model and discounting ambiguity. We focus on supermartingale criteria for different notions of time consistency. In particular we show how bubbles may appear in the dynamic penalization, and how they cause a breakdown of asymptotic safety of the risk assessment procedure.

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