

RISK MEASURES IN ORDERED NORMED LINEAR SPACES WITH NON-EMPTY CONE-INTERIOR

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ABSTRACT. In this paper, we use tools from the theory of partially ordered normed linear spaces, especially the bases of cones. This work extends the well-known results for convex and coherent risk measures. Its linchpin consists in the replacement of the riskless bond by some interior point in the cone of the space of risks, which stands as the alternative numeraire.

Keywords: base of a cone, well-based cones, numeraire asset, coherent and convex risk measures, representability of risk measures.

AMS (2010) Classification Numbers: 46B40, 91B30

JEL Classification Numbers: G320

1. CONCLUSIONS

In this paper we focus on the study of scalar risk measures in infinite-dimensional normed linear spaces. The property of monotonicity which is usually needed in defining such a measure establishes a connection between the study of risk measures and the geometric properties of the positive cone of the partial ordering assumed for the space of risks. This paper establishes some consequences of the existence of norm-interior points in this cone into the relevant theory when the numeraire asset is supposed to be such a point. The origins of those assumptions are two. The first is that such a point defines a base in the dual cone if the space is reflexive and the second is that base is norm-bounded. The first origin implies representation results similar to well-known ones for convex and coherent risk measures, while the second one implies the Lipschitz and other forms of continuity for these risk measures.

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