# Intrinsic risk measures

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## Abstract

Monetary risk measures classify a financial position by the minimal amount of external capital that must be added to the position to make it acceptable.

We propose a new concept: intrinsic risk measures. The definition via external capital is avoided and only internal resources appear. An intrinsic risk measure is defined by the smallest percentage of the currently held financial position which has to be sold and reinvested in an eligible asset such that the resulting position becomes acceptable.

We show that this approach requires less nominal investment in the eligible asset to reach acceptability. It provides a more direct path from unacceptable positions towards the acceptance set and implements desired properties such as monotonicity and quasi-convexity solely through the structure of the acceptance set. We derive a representation on cones and a dual representation on convex acceptance sets and we detail the connections of intrinsic risk measures to their monetary counterparts.

*Keywords*: intrinsic risk measures, monetary risk measures, acceptance sets, coherence, conicity, quasi-convexity, value at risk

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