

Time Consistent and Currency Invariant Convex Risk Measures

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Abstract

In order to study time-consistent monetary concave risk adjusted valuations in a continuous time, finite horizon setting, there arises a need to define risk adjusted valuations at all dates in the time continuum. One approach of tackling this issue is to define risk adjusted valuations at all dates and call this sequence of risk valuations as the risk valuation process. However, monetary risk adjusted valuations enjoy the translation invariance property which enables us to define monetary risk adjusted valuations at intermediate stopping times in terms of the date-0 risk adjusted valuation.

We characterize these intermediate risk adjusted valuations in terms of the date-0 risk adjusted valuation for strongly relevant time-consistent monetary risk measures. We seek to characterize convex risk measures which are both time consistent and currency invariant. We define currency invariance for monetary concave risk adjusted valuations. We show that only trivial monetary concave risk adjusted valuations satisfy both time consistency and currency invariance for all positive exchange rate processes.