

Capital Allocation by Percentile Layer

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Abstract

Motivation. Capital allocation can have substantial ramifications upon measuring risk adjusted profitability as well as setting risk loads for pricing. Current allocation methods that emphasize the tail allocate too much capital to extreme events; “capital consumption” methods, which incorporate relative likelihood, tend to allocate insufficient capital to highly unlikely yet extremely severe losses.

Method. In this paper I develop a new formulation of the meaning of holding capital equal to the value at risk. The new formulation views the total capital of the firm as the sum of many percentile layers of capital. Thus capital allocation varies continuously by layer, and the capital allocated to any particular loss scenario is the sum of allocated capital across many percentile layers.

Results. Capital allocation by percentile layer produces capital allocations that differ significantly from other common methods such as VaR, TVaR and coTVaR.

Conclusions. Capital allocation by percentile layer has important advantages over existing methods. It highlights a new formulation of value at risk and other capital standards, recognizes the capital usage of losses that do not extend into the tail and captures the disproportionate capital usage of severe losses.