The ability to identify, analyze, quantify, and act on risks is essential for the long-term profitability of financial services and individual investors. Also, the need for more comprehensible, more accurate, and possibly more conservative risk assessment techniques became clearer after the fallout from the 2007-2008 global financial crisis. The importance of financial risk management is not limited to reasons of earnings or corporate longevity; in a bid to improve the resilience of financial systems, regulators and¬ other authorities tend to impose stricter capital requirements and harsher consequences for companies – and their managements – who do not abide by the rules. Nowadays it is not uncommon for large financial institutions to split financial risk into multiple subclasses, each with its dedicated personnel, e.g. credit risk, liquidity risk, equity risk, and currency risk.

In the context of this paper, the distinction between risk metric and risk measure is not important, since each risk concept presented henceforth is both a different abstraction, i.e. risk metric, and a different mathematical construct, i.e. risk measure. There is, however, a set of formal requirements for a method to qualify as a coherent risk measure $\rho$ (@Artzner):

\*\*Translation invariance\*\*:

Adding a sure initial amount $\alpha$ to a portfolio $X$ and investing it in an instrument with a strictly positive price $r$ decreases $\rho$ by $\alpha$:

$$\rho(X+r)=\rho(X)-\alpha$$

\*\*Subadditivity\*\*:

Merging portfolios $X\_1$ and $X\_2$ into one portfolio does not increase the associated $\rho$:

$$\rho(X\_1+X\_2) \leq \rho(X\_1)+\rho(X\_2)$$

\*\*Positive homogeneity\*\*:

The risk of a portfolio $X$ is proportional to the portfolio’s size:

$$\rho(\lambda X)=\lambda \rho(X)$$

Where $\lambda\geq0$.

\*\*Monotonicity\*\*:

If portfolio $Y$ has always better values than portfolio $X$, then the risk of $Y$ is lower than that of $X$:

$$\forall \ Y \geq X : \rho(Y) \leq \rho(X)$$

These axioms form part of the argumentations for the preference of one risk metric over another in this paper.