Expected shortfall (ES) measures the expected loss suffered from an event occurring in the worst % of cases. It is the mean quantile of the portion of the distribution being considered, i.e. the center of mass of the tail from to the %-quantile, the latter having the same meaning as the . Because of this relationship, it follows that . Expected shortfall is also known as conditional VaR by virtue of it being the expected outcome given that the loss occurs at or below the indicated VaR (@QRM).

**\*\*Mathematical Definition:\*\***

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Expected shortfall:

Expected shortfall satisfies all axioms of a coherent risk measure. Unlike value-at-risk, ES always fosters risk reduction where it can be achieved through portfolio diversification with imperfectly correlated assets, regardless of the assets’ returns distributions. Compared to VaR, expected shortfall also gives a more realistic indication of the magnitude of losses, since it considers the mean of the tail and not its most optimistic value, capturing the tail’s inherent risk, and leading to more conservative exposures. Another advantage over VaR is that ES is less likely to be misleading in the comparison of assets with different distribution characteristics. For two assets with the same VaR, the instrument with the heavier tail will have a higher absolute expected shortfall. The standards published in 2016 by the Basel Committee on Banking Supervision also cite ES as a more prudent alternative to VaR (@BIS).