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Extreme risk and fractal regularity in finance.

As the current crisis reminds us, extreme movements in the level and volatility of asset prices are key features of financial markets. These phenomena are difficult to explain using traditional models in which extreme risk is specified as a rare event that is difficult to measure. Multifractal analysis, whose use in finance has considerably expanded over the past fifteen years, reveals that price series observed at different time horizons exhibit several forms of scale-invariance. Building on these observations, researchers have developed a new class of multifractal processes that generate reliable forecasts of the value at risk (VaR) and volatility of a portfolio of assets. The new models provide a structured framework for studying the likely size and price impact of events that are more extreme than the ones historically observed. (Received September 22, 2011)