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*On the Limitations of Financial Models.* Preliminary report.

Traditional statistical models such as the normal distribution have typically been used to predict the risk related to derivative securities. After the financial meltdown in 2008, some essayists and traders have attempted to explain what went wrong. This paper presents background and some of the perceived problems related to using the normal distribution for predicting rare events. For example, the probability that a single event will exceed the sum of the previous hundred events is a very small probability; so small that one can come to believe that it is zero. However, this probability is not as small when using some “thick-tailed” distributions such as the Pareto and Cauchy distributions. Probabilities of these rare events as well as put option prices will be analyzed and compared using the normal, Pareto, and Cauchy distributions. (Received September 09, 2016)