

Normal Distribution and Power-Law Distribution

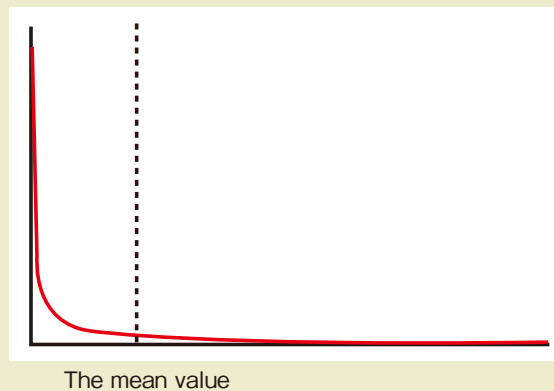
“Normal distribution” is the state in which variability of sample data points is similarly distributed before and after the mean value. The graph will show a bell-shaped curve that is symmetrical with the highest center at the mean value. In other words, more sample data is present around the mean value, which decreases as the value moves toward the left and right edges of the curve.

On the other hand, power-law distribution has more sample data with extreme value than normal distribution, drawing a curve with a long tail lowering as the value increases.

Normal distribution is considered the most basic form of statistics. In fact, most mathematical models in economics have employed this normal distribution, which has been invented in the field of natural science. However, recent results of econophysics indicate that many economic phenomena follow power-law distribution rather than normal distribution. For example, distribution of income or net assets and transition of stock prices have been known to follow power-law distribution rather than normal.

Power-law distribution is just one of many probability distributions, but it is considered a valuable tool to assess uncertainty issues that normal distribution cannot handle when they occur at a certain probability.

Power-law distribution



Normal distribution

