PARETO UPDATE

Pareto Density Distributions are Gaussian…

The true formula of Pareto Density Distributions has basically -as could be expected - Gaussian/Normal structure.

$$F(x)=k\cdot e^{-\left[\frac{(\int \ln \ln(x)-\int \ln \ln(\mu))^2}{(2\cdot\int \ln \ln(\sigma))^2}\right]}$$

Their curious, Gaussian structure reflects the fact that they are derived from multiplicative & multiple interactions of log - normal distributions of a large number of factors interacting simultaneously in a sort of networked turbo-chain-reaction on each other, during their generation.

Single factors have a normal density distribution.
Two factors interacting multiplicatively and simultaneously result in a log-normal density distribution. (See reference #2, below.) A host of factors interacting multiplicatively and simultaneously result in integration based normal distributions. (= “Pareto”)

Literature is replete with successful attempts to provide a simulative Pareto-formula. The bulk of them appear to be based on cleverly "tweaked" hyperbolic curves. The author has encountered only two exceptions (of the genus universal chameleon:” tell me what I am supposed to be the look-alike of; I shall comply“) These only confirm the basic observation. Whilst all of them constitute serviceable tools they do not lead on to further, deeper insights. They rather put a dead stop to further exploration.
On the other hand ,one does not fit chameleon-type –formulae to distributions which are obviously of a normal or log-normal nature. Why insult Pareto-distributions with such an obtuse approach. ..
The above Gaussian/ normal-curve- and integral-based formula describes the inner structure and generation of Pareto distributions rather than merely outwardly resembling them.

We also found a closely related variant of the formula given above; fitting the bill in most respects. (See reference #1)

By means of spreadsheet-programs the generation of Pareto Distributions can be demonstrated. Curve-fitting to field gathered Pareto -Distributions in step-by-step progressive precision is shown in detail (with all cell-formulae fully listed). (More detailed "instructions for use " can be found in # 1 of the 2 papers listed below.)

For those readers who, very wisely, dread the manual entering of large quantities of formulae in arrays and shudder at the thought of the time and brain-energy consuming hassles of testing and subsequent debugging, the author is offering as free “shareware”, Excell spreadsheets based on this Gaussian approach.They can be used ,say for fitting Pareto curves to field-gathered distributions without further ado. They will be transmitted upon e-mail -request free of charge by e-mail without any strings attached. (dockop@mweb.co.za).

The papers mentioned above have both appeared in “ Quality and Quantity”, Kluwer Academic Publishers. viz. P.O.Box 322, 3300 AH Dordrecht, The Netherlands. They are also available over the Internet from the Kluwer group as electronic editions, etc. via http: www.wkap.nl. or Renee.deboo@ @wkap.nl .

Viz. #1) Pareto Density Distributions, H.C.Kopperer, Quality and Quantity, pp. 43-67, Vol.37, No.1, March 2003, Kluwer Academic Publishers, P.O.Box 322, 3300 AH, Dordrecht, The Netherlands.

Viz. #2) Reflections on the Structure and Origin of Pareto Income Distributions. H.C.Kopperer, Quality and Quantity, pp. 213 – 227, Vol.32, No. 3, Aug. l998, Kluwer Academic Publishers, P.O.Box 322, 3300 AH Dordrecht, The Netherlands.

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