

Preface

The standard normal distribution dates back to a pamphlet of de Moivre dated 12 November 1733. Further improvements were given by Laplace in 1774. The work of Gauss in 1809 and 1816 established techniques based on the normal distribution, which became standard during the nineteenth century. For both theoretical and practical reasons, the normal distribution is probably the most important distribution, not only in statistics. However, as mentioned by Chew (1968), “other probability distributions than the normal distribution may be more convenient mathematically to serve as model for the observations.” Among the symmetrical distributions with an infinite domain, the most popular alternative to the normal is the logistic distribution which was already used by Verhulst (1845) in economic and demographic studies as well as the Laplace or the double exponential distribution which had its origin in 1774, where Laplace presented his first law of error. Its “two-piece nature” and its lack of differentiability at zero make the Laplace distribution sometimes unattractive and inconvenient. Occasionally, the Cauchy distribution is used, noting tails are so heavy that the mean and standard deviation as well as all higher moments are undefined. Surprisingly, one distribution avoided attracting attention, although already Manoukian and Nadeau (1988) had stated that

...the hyperbolic-secant distribution, which has not recieved sufficient attention in the published literature, and may be useful for students and practitioners.

During the last few years, however, several generalizations of the hyperbolic secant distribution have become popular in the context of financial return data because of its excellent fit. Nearly all of them are summarized within this Springer Brief.

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