

# APPLICATION OF LOGNORMAL DISTRIBUTION TO THE SIZE DISTRIBUTION OF CULTIVATED HOLDINGS

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IN measuring concentration, Lorenz measure is generally used. In this method, however, in making comparisons of concentration over time and space one is in a particularly disadvantageous position of not being able to judge whether the apparent difference in the degree of concentration is due to sampling variations or whether the difference is really significant. If, however, the observations follow a lognormal distribution, the dispersion parameter of the distribution can be interpreted as a measure of concentration, and use of this facilitates statistical testing of measurement of changes in the degree of concentration.

Similarly, as a measure of central tendency, it is the arithmetic mean that is generally used. This is the most probable value of the variate if the distribution follows a normal law. However, if it is lognormal, the geometric mean of the observations yields the most probable value of the variate, i.e. the arithmetic mean of the logarithms of the observations yields the most probable value of the logarithms of the variate.<sup>1</sup> As such if the distribution is lognormal, the geometric mean rather than arithmetic mean should be preferred as a measure of central tendency. Moreover, when the distribution follows the lognormal law, geometric mean is amenable to statistical testing so that one can judge whether the apparent change in the average size is due to sampling variation or whether there is really a significant change.

In economic data a fairly large number of distributions are positively skewed. If a lognormal curve which is positively skewed can satisfactorily be fitted to them, one will be on surer ground in drawing conclusions about changes in average size and concentration. In the sequel an attempt is made to examine whether a two-parameter lognormal distribution is a fairly good approximation to the size distribution of cultivated holdings, which is found to be positively skewed. The data for this study are taken from the village surveys conducted by the Gokhale Institute of Politics and Economics.

The lognormal distribution may be defined as the distribution of a variate whose logarithm is normally distributed. "It arises from a theory of elementary errors combined by a multiplicative process, just as the normal

<sup>1</sup> Keynes J. M., 'A Treatise On Probability', London, Edition of 1952, p. 197-99.