

Stochastic Orders, Moshe Shaked, J. George Shanthikumar, Springer, 233 Spring Street, New York NY 10013, 2007, ISBN 10: 0-387-32915-3, 473pp., \$89.95.

One of the important statistical application is to make influence about the means and variances of two or more populations. This is frequently encountered in the field of quality and reliability, to compare quality characteristics, to compare reliabilities of several products.

This book presents a unified approach and exploring the application of wide varieties of methods to order the random variables. Since, in a way, comparisons of the univariate or multivariate quality characteristics, which including the reliabilities, is a comparison of some kind of statistical order according to the authors of this book.

The stochastic order presented in this book includes in Chapter 1 : the stochastic order, Hazard Rate order, likelihood ration order and convolution order; Chapter 2: the mean residual life order, the harmonic mean residual life order; Chapter 3: Convex order, dispersive order, the excess wealth order, and the peakedness order; Chapter 4: The monotone convex and concave orders, transform orders; Chapter 5: The Laplace transform orders; Chapter 6: Multivariate stochastic orders, which expands the definition of the most stochastic orders discussed in Chapter 1 and 2 to multivariate cases. Chapter 7 is a multivariate version of the Chapters 3 , 4 and 5. Chapter 8 provides special discussions in convexity and concavity. And the Chapter 9 provides a discussion of positive dependence orders.

To properly understand the content of the book, readers must be very comfortable with the writing style of mathematicians, that is, provides a simple motivation, theoretical or practical, then followed by a definition, such as what it means by a specific kind of stochastic order, then followed by theorems to state or prove of certain ordering properties. It can be an elegant writing mathematically, for the none mathematical inclined readers, it may requires some tutoring in order to grasp the materials.

This book provides a wealth of information about how to study some specific kind of statistical order, which oftentimes being encountered in the quality and reliability, or survival analysis. This will be suitable for readers with advanced training in probability and statistics. It is long in theoretical treatment, but short in real life examples. So, this book is not for the novice students of quality and reliability.

Shin Ta Liu

Lynx Systems , San Diego