

Rossi, Peter E., *Bayesian Non- and Semi-parametric Methods and Applications*. Princeton, 2014, 202p bibl index ISBN 9780691145327, \$45.00

Rossi—UCLA professor of marketing, statistics, and economics; creator of bayesm (R software for Bayesian inference); and lead author of *Bayesian Statistics and Marketing* (Wiley, 2005)—has deep knowledge of the book’s titular methods.

Traditional parametric methods typically involve assuming that a variable y is a known function of variables \mathbf{x} and a few parameters, plus a disturbance ϵ with a normal distribution. In contrast, Rossi’s methods use *mixtures* of normal distributions to approximate ϵ ’s distribution in semi-parametric models and y ’s conditional distribution given \mathbf{x} in non-parametric models.

Mixture models implemented in R packages—e.g., bayesm, BayesMix, and DPpackage—facilitate exploration of large and complex datasets. Rossi’s applications of mixture models to cross-sectional data nicely complement Sylvia Frühwirth-Schnatter’s applications to time-series in *Finite Mixture and Markov Switching Models* (Springer 2006).

An issue meriting further study concerns prior distributions and loss functions. With no explicit loss function, Rossi adapts prior distributions to sample size to “produce sensible estimates” (p. 74). Other researchers may prefer basing prior distributions only on prior information, while minimizing expected loss (e.g., deviation from sensible estimates), as in Guglielmi et al., *Applied Statistics*, Jan. 2014, pp. 25–46.

Summing up: Essential for graduate students, faculty, and practitioners.
—J. P. Burkett, University of Rhode Island