

References

1. Abila, N. (2010). Biofuels adoption in Nigeria. *Management of Environmental Quality: An International Journal*, 21(6), 785–795.
2. Agarwal, B. L. (2006). *Basic statistics*. New Delhi: New Age International Publishers.
3. Agarwal, R. (2004). *Forecasting techniques in crops*. New Delhi: IASRI Publication.
4. Agresti, A. (1990). *Categorical data analysis*. New York: Wiley.
5. Aigner, D. J. (1971). *Basic econometrics*. London: Prentice-Hall.
6. Aitken, M., Anderson, D., Francis, B., & Hinde, J. (1989). *Statistical modelling in GLIM*. Oxford: Clarendon Press.
7. Allen, R. G. D. (1951). *Statistics for economics*. London: Hutchinson Universal Library.
8. Anderson, T. W. (1963). *An Introduction to multivariate statistical analysis*. New York: Wiley.
9. Anderson, T. W. (1958). *An introduction to multivariate analysis*. New York: Wiley.
10. Gelman, A., & Nolan, D. (2002). *Teaching statistics: A bag of tricks*. Oxford: Oxford University Press.
11. Annual Report. (1994). *International Centre for Agricultural Research in the Dry Areas (ICARDA)*, PB 5466 (pp. 29–30). Syria: Aleppo.
12. Anonymous. (1984). *Linear probability, logit and probit models*. California: Sage Publication.
13. Anscombe, F. J. (1954). Fixed-sample-size analysis of sequential observations applications. *Journal of the American Statistical Association*, 78, 47.
14. Armstrong, J. S., & Collopy, F. (1992). Error measures for generalizing about forecasting methods: Empirical comparisons. *International Journal of Forecasting*, 8, 69–80.
15. Arnold, S. J. (1979). A test for clusters. *Journal of Marketing Research*, 16, 545–551.
16. Berndt, E. R. (1991). *The practice of econometrics: Classic and contemporary*. Reading: Addison and Wesley.
17. Bhattacharya, G. K., & Johnson, R. A. (1977). *Statistical concepts and methods*. New York: J. Wiley & sons.
18. Billingsley, P. (1995). *Probability and measure* (3rd ed.). New York: Wiley.
19. Blackwell, D., & Girshick, M. A. (1954). *Theory of games and statistical decision*. New York: Wiley.
20. Bolger, F., & Wright, G. (1994). Assessing the quality of expert judgment: Issues and analysis. *Decision Support System*, 11, 1–24.
21. Box, G. E. P., & Jenkins, G. M. (1976). *Time series analysis: Forecasting and control*. San Francisco: Holden Day.
22. Bradley, M. D., & Jansen, D. W. (2004). Forecasting with a non-linear dynamic model of stock returns and industrial production. *International Journal of Forecasting*, 20, 321–342.
23. Brazil, C., West, F., & Baker, T. (2007). Togiak herring forecast. *A release by Alaska department of fish and game division of commercial fisheries on 11.9.06*.
24. Breslow, N. (1990). Biostatistics and bayes. *Statistical Science*, 5, 269.
25. Bridge, J. I. (1971). *Applied econometrics*. Amsterdam: North Holland.
26. Brockwell, P. J., & Davis, R. A. (1987). *Time series: Theory and methods*. New York: Springer.
27. Bross, I. (1952). Sequential medical plans. *Biometrics*, 8, 188–205.
28. Brown, D., & Rothery, P. (1993). *Models in biology: Mathematics, statistics and computing*. New York: Wiley.
29. Brown, E. N., & Kass, R. E. (2009). What is statistics? (with discussion). *American Statistician*, 63, 105–123.
30. Brugere, C., & Ridler, N. (2004). *Global aquaculture outlook in the next decades: An analysis of national aquaculture production forecasts to 2030* (FAO Fisheries Circular No 1001). Rome.
31. Burdick, R. K., & Graybill, F. A. (1992). *Confidence intervals on variance components*. New York: Marcel Dekker.
32. Carroll, R. J., & Ruppert, D. (1988). *Transformation and weighting in regression*. London: Chapman and Hall.
33. Casella, G., & Berger, R. L. (1990). *Statistical inference*. Pacific Grove: Wadsworth/Brooks Cole.
34. Ramesh, C. (2004). *Agricultural growth during the reforms and liberalization: Issues and concerns* (Policy brief (20)). New Delhi: NCAP, ICAR.

35. Chatterji, S., & Price, B. (1991). *Regression analysis by example*. New York: John Wiley & Sons.
36. Chen, D. G., & Ware, D. M. (1999). A neural network model for forecasting fish stock recruitment. *Canadian Journal of Fisheries and Aquatic Sciences*, 56(12), 2385–2396.
37. Chernick, M. R., & Friis, R. (2003). *Introductory biostatistics for the health sciences*. New York: Wiley.
38. Chiang, C. (1984). *Fundamental methods of mathematical economics*, 3rd edn. New York: McGraw-Hill.
39. Child, D. (1970). *The essentials of factor analysis*. New York: Holt, Rinehart & Winston.
40. Chow, G. C. (1960). Test of equality between sets of coefficient in two linear regressions. *Econometrica*, 28(3), 591–605.
41. Chow, G. C. (1983). *Econometric methods*. New York: McGraw-Hill.
42. Christ, C. (1966). *Economic models and methods*. Wiley.
43. Christensen, R. (1996). *Plane answers to complex questions: The theory of linear models* (2nd ed.). New York: Springer.
44. Christopher, A. H. (1982). *Interpreting and using regression*. New York: Sage Publication.
45. Chung, K. L. (1968). *A course in probability theory*. New York: Harcourt, Brace & World.
46. Clements, M. P., & Smith, J. (1997). The performance of alternative methods for SETAR models. *International Journal of Forecasting*, 13, 463–475.
47. Cochran, W. G. (1985). *Sampling technique*. New Delhi: Wiley Eastern Limited.
48. Cox, D. R. (1958). Some problems connected with statistical inference. *Annals of Mathematical Statistics*, 9(2), 375–372.
49. Cox, D. R. (1990). Role of models in statistical analysis. *Statistical Science*, 5, 169–174. MR1062575
50. Croxton, F. E., & Cowden, D. J. (1964). *Applied general statistics*. Prentice-Hall.
51. Lindley, D. V., & Phillips, L. D. (1976). Inference for a Bernoulli process (a bayesian view). *The American Statistician*, 30(3), 112–119.
52. Dabholkar, A. R. (1992). *Elements of biometrical genetics*. New Delhi: Concept Publishing Co.
53. Darlington, R. B., Weinberg, S., & Walberg, H. (1973). Canonical variate analysis and related techniques. *Review of Educational Research*, 43–454.
54. Das, N. G. (2002). *Statistical methods* (Vol. 1). Kolkata: M Das and Co.
55. Das, N. G. (2002). *Statistical methods* (Vol. 2). Kolkata: M Das and Co.
56. Hand, D. J., Fergus, D., McConway, K., Lunn, D., & Ostrowski, E. (2011). *A handbook of small data sets* (Vol. 1). New York: CRC Press.
57. Delgado, C. L., Wada, N., Rosegrant, M. W., Meijer, S., & Ahmed, M. (2003). *Fish to 2020. Supply and demand in changing market*. Pnang: International Food Policy Research Institute, Washington, DC and World Fish Center.
58. Department of Agricultural Statistics. (2002). *Manual on computational statistics in agricultural sciences*. West Bengal: Bidhan Chandra Krishi Viswavidyalaya.
59. Department of Agricultural Statistics. (2004). *Manual on recent advances in computational statistics in agricultural sciences*. West Bengal: Bidhan Chandra Krishi Viswavidyalaya.
60. Raj, D., & Chandhok, P. (1999). *Samplpe survey theory*. New Delhi: Narosa Publishing House.
61. Dillon, W. R., & Goldstein, M. (1984). *Multivariate analysis: Methods and applications*. New York: Wiley.
62. Dimatteo, I., Genovese, C. R., & Kass, R. E. (2001). Bayesian curve-fitting with free-knot splines. *Biometrika*, 88.
63. Doraiswamy, P. C., Moulin, S., Cook, P. W., & Stern, A. (2003). Crop yield assessment from remote sensing. *PE and RS Photogramatic Engineering and Remote Sensing*, 69(6), 665–674.
64. Draper, N. R., & Smith, H. (1998). *Applied regression analysis* (3rd ed.). New York: Wiley.
65. Durbin, J. (1960). Estimation of parameters in time series regression model. *Journal of the Royal Statistical Society-Ser-B*, 22, 139–153.
66. Dutta, M. (1975). *Econometric methods*. Cincinnati: South Western Publishing Company.
67. Jaynes, E. T. (2003). *Probability theory: The logic of science*. Cambridge University Press, Cambridge, Edited by G. Larry Bretthorst.
68. Eberhart, S. A., & Russell, W. L. (1966). Stability parameters for comparing varieties. *Crop Science*, 6, 36–40.
69. Edwards, A. W. F. (1972). *Likelihood*. London: Cambridge University Press.
70. Engelman, L., & Hartigan, J. A. (1969). Percentage points of a test for clusters. *Journal of American Statistical Association*, 64, 1647–1648.
71. Engle, R. F. (1982). Autoregressive conditional heteroscedasticity with estimates of the variance of the United Kingdom inflation. *Econometrica*, 50, 987–1008.
72. Everitt, B. (1980). *Cluster analysis*. New York: J Wiley and Sons.
73. Everitt, B. S. (1977). *The analysis of contingency tables*. New York: J Wiley and Sons.
74. Ezekiel, M., & Fox, K. A. (1959). *Methods of correlation and regression analysis*. New York: J Wiley and Sons.
75. Mosteller, F. (1965). *Fifty challenging problems in probability with solutions*. Reading: Dover Publications.
76. Farrar, D. E., & Glauber, R. R. (1967). Multicollinearity in regression analysis: The problem revisited. *Review of Economics and Statistics*, 49, 92–107.
77. Feller, W. (1968). *An introduction to probability theory and its applications*. New York: J Wiley and Sons.

78. Feller, W. (1971). *An introduction to probability theory and its applications* (Vol. 2). Wiley. New York.
79. Feller, W. (1968). *An introduction to probability theory and its applications* (3rd ed., Vol. 1). New York: Wiley.
80. Feller, W. (1971). *An introduction to probability theory and its applications* (2nd ed., Vol. 2). New York: Wiley.
81. Ferguson, T. S. (1996). *A course in large sample theory*. London: Chapman and Hall.
82. Ferguson, T. S. (1967). *Mathematical statistics*. New York: Academic Press.
83. Finley, K. W., & Wilkinson, G. M. (1963). The analysis of adaptation in plant breeding programme. *Australian Journal Agricultural Research*, 14, 742–757.
84. Finney, D. J. (1981). *Probit analysis*. New Delhi: S Chand and Company Ltd.
85. Fisher, R. A., & Frank, Y. (1979). *Statistical tables for biological, agricultural and medical research*. London: Longman.
86. Fisz, M. (1963). *Probability theory and mathematical statistics*, 3rd edn. Wiley.
87. Fox, K. (1968). *Intermediate economic statistics*. New York: J Wiley and Sons.
88. Fraser, D. A. S. (1965). *Nonparametric methods in statistics*. New York: Wiley.
89. Freedman, D., Pisani, R., & Purves, R. (2007). *Statistics* (4th ed.). New York: W. W. Norton.
90. Freedman, D., Pisani, R., Purves, R., & Adhikari, A. (1991). *Statistics* (2nd ed.). New York: Norton.
91. Freund, J. E. (1992). *Mathematical statistics*. Englewood: Prentice-Hall.
92. Galbraith, J. W., & Kisinbay, T. (2005). Content horizons for conditional variance forecasts. *International Journal of Forecasting*, 21, 249–260.
93. Gangwar, B., Katyal, V., & Anand, K. V. (2003). Productivity, stability and efficiency of different cropping sequences in Maharashtra. *Indian Journal of Agricultural Sciences*, 73(9), 471–477.
94. Gardner, E. S., Jr. (1985). Exponential smoothing: The state of the art. *Journal of Forecasting*, 4, 1–38.
95. Gibbons, J. D. (1971). *Nonparametric inference*. New York: McGraw-Hill.
96. Gibbons, J. D., & Chakrabarty, S. (1985). *Nonparametric methods for quantitative analysis*. Columbus: American Sciences Press.
97. Gillies, D. A. (1973). *An objective theory of probability*. London: Methuen.
98. Glejser, H. (1969). A new test for heteroscedasticity. *Journal of the American Statistical Association*, 64, 316–323.
99. Glymour, C. (2001). Instrumental probability. *The Monist*, 84, 284–300.
100. Gnedenko, B. V. (1978). *The theory of probability*. Moscow: MIR Publishers.
101. Goldberg, S. (1960). *Probability, an introduction*. London: Prentice-Hall.
102. Goldberger, A. S. (1964). *Econometric theory*. New York: Wiley.
103. Goldfield, S. M., & Quandt, R. E. (1972). *Nonlinear methods in econometrics*. Amsterdam: North Holland Publishing Company.
104. Goon, A. M., Gupta, M. K., & Dasgupta, B. (1998). *Fundamentals of statistics* (Vol. 1). Kolkata: World Press.
105. Goon, A. M., Gupta, M. K., & Dasgupta, B. (1998). *Fundamentals of statistics* (Vol. 2). Kolkata: World Press.
106. Goon, A. M., Gupta, M. K., & Dasgupta, B. (1998). *Outline of statistics* (Vol. 1). Kolkata: World Press.
107. Goon, A. M., Gupta, M. K., & Dasgupta, B. (1998). *Outline of statistics* (Vol. 2). Kolkata: World Press.
108. Gorsuch, R. L. (1983). *Factor analysis*. Hillsdale: Erlbaum.
109. Gotsch, N., & Rieder, P. (1990). Forecasting future developments in crop protection. *Crop Protection*, 9 (2), 83–89.
110. Granger, C. W. J. & Mowbold, P. (1976). R^2 and the transformation of regression variables. *Journal of Econometrics*, 4, 205–210.
111. Granger, C. W. J. (1969, July). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica*, 37(3): 424–438.
112. Graybill, F. A. (1961). *Introduction to linear statistical models* (Vol. 1). Mc-Graw Hill Inc., New York.
113. Gujarati, D. N. (1995). *Basic econometrics*. Singapore: McGraw-Hill Inc.
114. Gupta, S. C., & Kapoor, V. K. (2002). *Fundamentals of mathematical statistics*. New Delhi: Sultan Chand and Sons.
115. Gupta, S. C., & Kapoor, V. K. (2004). *Fundamentals of applied statistics*. New Delhi: Sultan Chand and Sons.
116. Gupta, S. C. (2001). *Fundamentals of statistics*. Mumbai: Himalaya Publishing House.
117. Hartigan, J. A. (1975). *Clustering algorithm*. New York: Wiley.
118. Harvill, J. L., & Ray, B. K. (2005). A note on multi-step forecasting with functional coefficient autoregressive models. *International Journal of Forecasting*, 21, 717–727.
119. Hedayat, A. S., & Sinha, B. K. (1991). *Design and inference in finite population sampling*. New York: Wiley.
120. Hogg, R. V., & Craig, A. T. (1972). *Introduction to mathematical statistics*. New Delhi: Amerind.
121. Hollander, M., & Wolfe, D. A. (1973). *Nonparametric statistical methods*. New York: J Wiley and Sons.
122. Howling, G. G., Harrington, R., Clark, S. J., & Bale, J. S. (1993). The use of multiple regression via principal components in forecasting early season aphid (Homoptera: Aphididae) flight. *Bulletin of Entomological Research*, 83(3), 377–381.
123. Hsu, J. C. (1996). *Multiple comparisons: Theory and methods*. London: Chapman and Hall.

124. Jeffreys, H. (1931). *Theory of probability*. Oxford: Oxford University.
125. Johnson, N. L., Kotz, S., & Kemp, A. W. (1992). *Univariate discrete distributions* (2nd ed.). New York: Wiley.
126. Johnson, N. L., Kotz, S., & Balakrishnan, N. (1994). *Continuous Univariate distributions* (2nd ed., Vol. 1). New York: Wiley.
127. Johnston, J. (1985). *Econometric methods* (3rd ed.). New York: Mc-Graw-Hill Book Company.
128. Kadane, J. B., Schervish, M. J., & Seidenfeld, T. (1999). *Rethinking the foundation of statistics*. London: Cambridge University Press.
129. Kahnemann, D., Slovic, P., & Tversky, A. (1982). *Judgement under uncertainty: Heuristics and biases*. London: Cambridge University Press.
130. Kalbfleisch, J. D., & Prentice, R. L. (1980). *The statistical analysis of failure time data*. New York: Wiley.
131. Kane, E. J. (1968). *Economic statistics and econometrics*. New York: Harper International.
132. Kapoor, J. N., & Saxena, H. C. (1973). *Mathematical statistics*. New Delhi: S Chand and Co (Pvt) Ltd.
133. Kaps, M., & Lamberson, W. R. (2004). *Biostatistics for animal science*. Cambridge: CABI Publishing.
134. Kass, R. E. (2006). Kinds of Bayesians (comment on articles by Berger and by Goldstein). *Bayesian Analysis*, 1, 437–440.
135. Kass, R. E., & Wasserman, L. A. (1996). The selection of prior distributions by formal rules. *Journal of the American Statistical Association*, 91.
136. Kass, R. E., Ventura, V., & Brown, E. N. (2005). Statistical issues in the analysis of neuronal data. *Journal of Neurophysiology*, 94, 8–25.
137. Katyal, V., Sharma, S. K., & Gangwar, K. S. (1998). Stability analysis of rice (*Oryza sativa*)- wheat (*Triticum aestivum*) cropping system in integrated nutrient management. *Indian Journal of Agricultural Sciences*, 68(2), 513–516.
138. Katyal, V., Gangwar, K. S., & Gangwar, B. (2000). Yield stability in rice (*Oryza sativa*)- Wheat (*Triticum aestivum*) system under long term fertilizer use. *Indian Journal of Agricultural Sciences*, 70(5), 277–281.
139. Kendall, M. G., & Stuart, A. (1968). *The advance theory of statistics* (2nd ed., Vol. 3). London: Charles Griffin and Company Limited.
140. Kendall, M., & Stuart, A. (1973). *The advance theory of statistics* (Vol. 2). London: Charles Griffin and Co. Ltd.
141. Kendall, M., & Stuart, A. (1977). *The advance theory of statistics* (Vol. 1). London: Charles Griffin and Co. Ltd.
142. Kendall, M. G. (1962). *Rank correlation methods* (3rd ed.). London: Griffin.
143. Keynes, J. M. (1921). *A treatise on probability*. London: Macmillan.
144. Kim, J. H. (2003). Forecasting autoregressive time series with bias corrected parameter estimators. *International Journal of Forecasting*, 19, 493–502.
145. Klien, L. R., & Shinkai, Y. (1963). An econometric model of Japan, 1930–1959. *International Economic Review*, 4, 1–28.
146. Klien, L. R. (1962). *An introduction to econometrics*. London: Prentice-Hall.
147. Kmenta, J. (1986). *Elements of econometrics* (2nd ed.). New York: Macmillan.
148. Knuth, D. E. (1968). *The art of computer programming, volume 2 (Seminumerical Algorithm)*. Reading: Addison Wesley.
149. Kolmogorov, A. N., & Fomin, S. V. (1961). *Elements of the theory of functions and functional analysis* (Vol. 2). Albany/New York: Graylock Press.
150. Koutsoyiannis, A. (1977). *Theory of econometrics*. London: Macmillan Press Ltd.
151. Kraft, C. H., & Eeden, C. V. (1968). *A nonparametric introduction to statistics*. New York: Macmillan.
152. Kramer, J. S. (1991). *The logit model for economists*. London: Edward Arnold Publishers.
153. Kvalseth, T. O. (1985). Cautionary note about R^2 . *American Statistician*, 39, 279–285.
154. Heaps, L. (1978). *Statistical inference for everyone. Operation morning light*. Paddington, S.I, ISBN 0709203233.180.
155. Lawrence, M., Edmundson, R., & O’Conor, M. (1985). An examination of the accuracy of the judgemental extrapolation of time series. *International Journal of Forecasting*, 1, 25–35.
156. Lee, K. L. (1979). Multivariate tests for clusters. *Journal of American Statistical Association*, 74, 708–714.
157. Lehmann, E. L. (1959). *Testing statistical hypotheses*. New York: Wiley.
158. Lehmann, E. L. (1986). *Testing statistical hypotheses* (2nd ed.). New York: Wiley.
159. Lehmann, E. L. (1999). *Introduction to large-sample theory*. New York: Springer.
160. Lehmann, E. L. (1990). Model specification: The views of Fisher and Neyman, and later developments. *Statistical Science*, 5, 160–168.
161. Lehmann, E. L. (1999). *Elements of large-sample theory*. New York: Springer.
162. Lehmann, E. L., & Casella, G. (1998). *Theory of point estimation* (2nd ed.). New York: Springer.
163. Leser, C. (1966). *Econometric techniques and problems*. London: Griffin.
164. Lewis, D. (1996). Elusive knowledge. *Australasian Journal of Philosophy*, 4(4), 549–567.
165. Lewis, S. (1995). *The art and science of smalltalk*. London: Prentice Hall.
166. Liddle, J., Williamson, M., & Irwig, L. (1996). *Method for evaluating research guideline evidence. Technical report*. Sydney: NSW Department of Health.
167. Lindgren, B. W. (1968). *Statistical theory* (2nd ed.). New York: The Macmillan Company.
168. Little, R. J. A., & Rubin, D. B. (1987). *Statistical analysis with missing data*. New York: Wiley.

169. Loeve, M. (1963). *Probability theory* (3rd ed.). Princeton: Van Nostrand.
170. Lukacs, E. (1970). *Characteristic functions* (2nd ed.). New York: Hafner.
171. Lukacs, E. (1972). *Probability and mathematical statistics*. New York: Academic Press.
172. Lush, J. L. (1943). *Animal breeding plans*. Iowa State College: Press.
173. Madala, G. S. (1983). *Limited dependent and qualitative variables in econometrics*. New York: Cambridge University Press.
174. Madhani, J. M. K. (1988). *Introduction to econometrics: Principles and applications* (4th ed.). New Delhi: Oxford and IBH Publishing Co. Pvt Ltd.
175. Mansor, S., Tan, C. K., Ibrahim, H. M., & Shariff, A. R. Md. (2001). Satellite fish forecasting. In South China Sea. Paper presented at the 22nd Asian conference on remote sensing, 5–9 November 2001, Singapore.
176. Marino, M. J. (2013). The use and misuse of statistical methodologies in pharmacology research. *Biochemical Pharmacology*, 87(1), 78–92.
177. Mascarenhas, J., et al. (1991). *Participatory rural appraisal: Proceedings of the february Bangalore PRA trainers workshop, RRA notes, No. 13*. London: IIED and Bangalore: MYRADA, August 1991.
178. McClain, J. O., & Rao, V. R. (1975). CLUSTSIZ: A programme to test for the quality of clustering of a set of objects. *Journal of Marketing Research*, 12, 456–460.
179. McPherson, K. (1982). On choosing the number of interim analyses in clinical trials. *Statistics in Medicine*, 1(1), 25–36.
180. Montgomery, D., & Elizabeth, P. (1982). *Introduction to linear regression analysis*. New York: J Wiley and Sons.
181. Mood, A. M. (1950). *Introduction to the theory of statistics*. New York: McGraw Hill.
182. Mood, A. M., Graybill, F. A., & Boes, D. C. (1974). *Introduction to the theory of statistics*. London: McGraw-Hill.
183. Moore, D. S., & McCabe, G. (2005). *Introduction to the practice of statistics* (5th ed.). New York: W. H. Freeman.
184. Morrison, D. F. (1990). *Multivariate statistical methods*. New York: McGraw-Hill.
185. Narain, P., Soni, P. N., & Pandey, A. K. (1990). *Economics of long-term fertilizer use and yield sustainability: Soil fertility and fertilizer use. Vol. IV Nutrient management and supply system for sustaining in Agriculture* (pp 251–264). Indian Farmers Fertilizers Co-operative Limited. Agricultural Services Department, Marketing Division, Govardhan, 53–54, Nehru Place, New Delhi 110019.
186. Neter, J., Wasserman, W., & Whitmore, G. A. (1993). *Applied statistics*. Boston: Allyn & Bacon.
187. Newbold, P., Agiakloglou, C., & Miller, J. (1994). Adventure with ARIMA software. *International Journal of Forecasting*, 10, 573–581.
188. Novick, M. R., & Jackson, P. H. (1974). *Statistical methods for educational and psychological research*. New York: McGraw-Hill.
189. Pal, S., & Sahu, P. K. (2004). *Modeling pest incidence – A nonparametric approach*, Abstracted in the 24th ISF, held in Sydney, 2004.
190. Panse, V. G., & Sukhatme, P. V. (1989). *Statistical methods for agricultural workers*. New Delhi: Indian Council of Agricultural Research.
191. Park, R. E. (1966). Estimation with heteroscedastic error terms. *Econometrica*, 34(4), 888.
192. Parsons, D. G., & Colbourne, E. B. (2000). Forecasting fishery performance for Northern Shrimp (*Pandalus borealis*) on the Labrador Shelf, (NAFO Divisions 2HJ). *Journal of the Northwest Atlantic Fishery Science*, 27, 11–20.
193. Parzen, E. (1972). *Modern probability theory and its applications*. New York: Wiley Eastern.
194. Popper, K. (1959). *The logic of scientific discovery*. London: Hutchinson.
195. Prajneshu. (1998). A non-linear statistical model for aphid population growth. *Journal of the Indian Society of Agricultural Statistics*, 51, 73–80.
196. Prajneshu. (2007). Non-linear statistical models and their applications to crops, pests and fisheries. In *A diagnostic study of design and analysis of field experiments*. New Delhi: IASRI.
197. Ramasubramaniam, V. (2004). *Forecasting techniques in agriculture*. New Delhi: IASRI Publication.
198. Rangaswamy, R. (2000). *A text book of agricultural statistics*. New Delhi: New Age International (P) Limited Publishers.
199. Rao, C. R. (1952). *Advanced statistical methods in biometric research*. New York: J Wiley and Sons.
200. Rao, C. R. (1965). *Linear statistical inference and its applications*. New York: Wiley.
201. Ray, B. K. (1993). Long range forecasting of IBM product revenues using a seasonal fractionally differenced ARMA model. *International Journal of Forecasting*, 9, 255–269.
202. Chambers, R. (1994). Participatory Rural Appraisal (PRA): Challenges, potentials and paradigm. *World Development*, 22(10), 1437–1454.
203. Roger, Z. (2005). *Forecast for the 2005 brown shrimp season in the western Gulf of Mexico, from the Mississippi River to the US. – Mexico Border*. A release by the director, Galveston Laboratory. <http://galveston.ssp.nmfs.gov/galv>
204. Rohatgi, V. K. (1984). *Statistical inference*. New York: Wiley.
205. Ross, S. M. (1988). *A first course in probability theory* (3rd ed.). New York: Macmillan.
206. Sahu, P. K. (2013). *Agriculture and applied statistics – I. 2nd Reprint*. Kalyani Publishers, New Delhi.
207. Sahu, P. K., & Das, A. K. (2014). *Agriculture and applied statistics - II* (2nd ed.). New Delhi: Kalyani Publishers. (SAS Institute Inc., SAS 9.1.3 Help and Documentation, Cary, NC: SAS Institute Inc., 2002–2004. SPSS Inc. Released 2007. SPSS for Windows, Version 16.0. Chicago, SPSS Inc.)

208. Sahu, P. K. (2013). *Research methodology: A guide for researchers in agricultural science, social science and other related*. Fields: Springer.
209. Sahu, P. K., Santiranjan, P., & Das, A. K. (2015). *Estimation and inferential statistics*. Springer.
210. Sahu, P. K., Kundu, A. L., Mani, P. K., & Pramanick, M. (2005). Sustainability of different nutrient combinations in a long term rice-wheat cropping system. *Journal of New Seeds*, 7(3), 91–101.
211. Sarantis, N. (2001). Nonlinearities, cyclical behaviour and predictability in stock markets: International evidence. *International Journal of Forecasting*, 17, 459–482.
212. Savage, L. J. (1954). *The foundations of statistics*. New York: Wiley.
213. Scheffe, H. (1959). *The analysis of variance*. New York: Wiley.
214. Schervish, M. J. (1995). *Theory of statistics*. New York: Springer.
215. Seber, G. A. F. (1977). *Linear regression analysis*. New York: Wiley.
216. Seber, G. A. F., & Wild, C. J. (1989). *Nonlinear regression*. New York: Wiley.
217. Sender, N. R., & Manrodt, K. B. (2003). The efficiency of using judgmental versus quantitative forecasting methods in practice. *Omega*, 31, 511–522.
218. Shanti S. G., & Berger, J. O. (eds.). (1994). *Statistical decision theory and related topics V*. Springer.
219. Shao, J. (1999). *Mathematical statistics*. New York: Springer.
220. Sharma, J. R. (1998). *Statistical and biometrical techniques in plant breeding*. New Delhi: New Age International Publishers.
221. Shenoy, G. V., & Pant, M. (1994). *Statistical methods in business and social sciences*. New Delhi: Macmillan India Limited.
222. Shuard, H., & Rothery, A. (Eds.). (1984). *Children reading mathematics*. London: Murray.
223. Siddiq, E. A. (2002). Rice – Exploring means to adopt G M Rice. In *The Hindu survey of Indian agriculture* (pp. 47–52). Chennai: The Hindu.
224. Siegel, S. (1956). *Nonparametric statistics for the behavioral sciences*. London: McGraw-Hill.
225. Simon, H. A. (1982). *Models of bounded rationality*. MIT Press.
226. Daroga, S., & Chaudhary, F. S. (1989). *Theory and analysis of sample survey designs*. New Delhi: Wiley Eastern Limited.
227. Singh, R. K., & Chaudhary, B. D. (1995). *Biometrical methods in quantitative genetic analysis*. Ludhiana: Kalyani Publishers.
228. Skyrms, B. (1987). Dynamic coherence and probability kinematics. *Philosophy of Science*, 4(1), 1–20.
229. Smith, A. (1995). A conversation with Dennis Lindley. *Statistical Science*, 10(3), 305–319.
230. Sneath, P. (1957). The application of computers to taxonomy. *Journal of General Microbiology*, 17, 201–226.
231. Snedecor, G. W., & Cochran, W. G. (1989). *Statistical methods* (8th ed.). Ames: Iowa State University Press.
232. Snyder, R. D. (1985). Recursive estimation of dynamic linear statistical models. *Journal of Royal Statistical Society (B)*, 47, 272–276.
233. Sober, E. (2002). Instrumentalism, parsimony, and the akaike framework. *Philosophy of Science*, 69 (September 2002) pp. S112–S123. 0031-8248/2002/69 supp-0011\$10.00 Copyright 2002 by the Philosophy of Science Association.
234. Sokal, R. R., & Sneath, P. H. A. (1963). *Principles of numerical taxonomy*. London: Freeman.
235. Soni, P. N., Sikarwar, H. S., & Moheta, D. K. (1988). Long term effects of fertilizer application on productivity in rice-wheat sequence. *Indian Journal of Agronomy*, 33, 167–173.
236. Spiegel, M. R. (1988). *Theory and problems of statistics*. Singapore: McGraw-Hill Book Co.
237. Spiegelhalter, D. J., Freedman, L. S., & Blackburn, P. R. (1986). Monitoring clinical trials: Conditional or predictive power? *Control Clin Trials*, 7(1), 8–17.
238. Stanford, P. K. (2006). *Exceeding our grasp*. Oxford: Oxford University Press.
239. Steel, D. (2003). *A Bayesian way to make stopping rules matter*. *Erkenntnis*, 58, 213–227.
240. Stein, C. (1962). A remark on the likelihood principle. *Journal of the Royal Statistical Society Series A*, 125(4), 565–568.
241. Stone, M., & Dawid, A. P. (1972). Un-Bayesian implications of improper Bayes inference in routine statistical problems. *Biometrika*, 59, 369–375.
242. Stone, M. (1991). Discussion of ‘A likelihood paradox’ by Goldstein and Howard. *Journal of the Royal Statistical Society, Series B*, 53(3), 628.
243. Stone, M. (1976). Strong inconsistency from uniform priors. *Journal of the American Statistical Association*, 71, 114.116.
244. Strevins, M. (2004). Bayesian confirmation theory: Inductive logic, or mere inductive framework? *Synthese*, 141(3), 365.379.
245. Stuart, A., & Ord, J. K. (1987). *Kendall’s advanced theory of statistics* (5th ed., Vol. 1). New York: Oxford University Press.
246. Stuart, A., & Ord, J. K. (1991). *Kendall’s advanced theory of statistics* (5th ed., Vol. 2). New York: Oxford University Press.
247. Stuart, A., Ord, J. K., & Arnold, S. (1999). *Advanced theory of statistics, volume 2A: Classical inference and the linear model* (6th ed.). London: Oxford University Press.
248. Sweeting, T. J. (2001). Coverage probability bias, objective Bayes and the likelihood principle. *Biometrika*, 88(3), 657.675.
249. Teller, P. (1969). Goodman’s theory of projection. *British Journal of the Philosophy of Science*, 20, 219–238.

250. Theil, H. (1970). On the relationships involving qualitative variables. *American Journal of Sociology*, 76, 103–154.
251. Theil, H. (1972). *Principles of econometrics*. Amsterdam: North Holland.
252. Theil, H. (1978). *Introduction to econometrics*. Englewood: Prentice-Hall.
253. Thompson, W. A. Jr. (1969). *Applied probability*. New York: Holt, Rinehart and Winston.
254. Tintner, G. (1965). *Econometrics*. New York: Wiley.
255. Tufte, E. R. (2001). *The visual display of quantitative information* (2nd edn.). Cheshire: Graphics Press.
256. Vallecillos, A. (1999). Some empirical evidences on learning difficulties about testing, Vol. 2 Tome LVIII, 201–204. ISI.
257. Wald, A. (1947). *Sequential analysis*. New York: Wiley.
258. Walker, H. M., & Lev, J. (1965). *Statistical inference*. London: Oxford & IBH.
259. Wang, Z., & Bessler, D. A. (2004). Forecasting performance of multivariate time series models with a full and reduced rank: an empirical examination. *International Journal of Forecasting*, 20, 683–695.
260. Ward, J. (1963). Hierarchical grouping to optimize an objective function. *Journal of American Statistical Association*, 58, 236–244.
261. White, H. (1980). A heteroscedasticity consistent covariance matrix estimator and direct test of heteroscedasticity. *Econometrica*, 48, 817–898.
262. Wijkstrom, U. N. (2003). Short and long-term prospects for consumption of fish. *Veterinary Research Communications*, 27(Suppl.1), 461–468.
263. Wilks, S. S. (1962). *Mathematical statistics*. New York: Wiley.
264. WMO. (1992). *International meteorological vocabulary* (Vol. 18). Geneva: WMO.
265. Wolfe, J. H. (1970). Pattern of clustering by multivariate mixture analysis. *Multivariate Behavioral Research*, 5, 329–350.
266. Yamane, T. (1970). *Statistics*. New York: Harper International.
267. Ye, Y. (1999). *Historical consumption and future demand for fish and fishery products: Exploratory calculations for the years 2015–2030* (FAO Fisheries Circular No 946). Rome, FAO.
268. Yule, G. U., & Kendell, M. G. (1950). *Introduction to the theory of statistics (Introduction)*. London: Charles Griffin.
269. Yule, G. U. (1927). On the method of investigating periodicities in disturbed series with special reference to Wolfer's support numbers. *Philosophical Transactions of the Royal Society of London. Series A*, 226, 267–298.
270. Zacks, S. (1971). *The theory of statistical inference*. New York: Wiley.
271. Zellner, A. (1971). *An introduction to Bayesian inference in econometrics*. New York: Wiley.
272. Zou, H., & Yang, Y. (2004). Combining time series models for forecasting. *International Journal of Forecasting*, 20, 69–84.

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