Principles of Forecasting: A Handbook for Researchers and Practitioners, J. Scott Armstrong (Ed.), (2001),Boston: Kluwer Academic Publishers, 849 pages.

Review by: Gordon Welty

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This very readable handbook provides a comprehensive synopsis of the entire field of forecasting. The editor, Scott Armstrong, is highly qualified to pull together such a volume. He has been centrally involved in the development of the subject for more than two decades. Armstrong's publications cover the field, ranging from econometric modeling and the extrapolation of time-series data, to role playing and opinion-based forecasting; he is the author of the equally comprehensive book Long-Range Forecasting, which was published in 1978.

Because of his earlier work, especially *Long-Range Forecasting*, Armstrong realized that the field had grown dramatically since the second edition of that work had appeared (in 1985). It had grown so much that a synopsis required a group effort. And, because of his centrality to the field of forecasting, Armstrong is directly acquainted with the specialists in the field. As a founding editor of two of the premiere journals, the *Journal of Forecasting* (founded in 1981) and the *International Journal of Forecasting* (founded in 1985), Armstrong not only knows these specialists but could invite their participation in a truly encyclopedic venture.   39 specialists responded to his invitation: the result is the 30 chapters of the handbook, discussing eleven forecasting methods in terms of more than 130 forecasting principles.

Three features of the Handbook enhance its usability:

   a)   the structure of the chapters;
   b)   the "Methodology Tree" that analyses the unity and differences of the eleven forecasting methods;
   c)   the forecasting principles Web site (forecastingprinciples.com) that hosts material covered in the handbook and allows for continual updating as well.

Let us comment further on these three features.

Regarding structure, each chapter provides

   a)   a description of the specific forecasting topic,
   b)   a series of "principles" that can guide a practitioner involved with that topic,
   c)   a review of the evidence that supports each principle, and
   d)   a review of implications of the foregoing for practitioners and researchers.

When authors departed somewhat from an explicit use of this format (as happened in the intentions, conjoint analysis, and neural networks chapters), it was more difficult to understand the principles. The structure of the chapters enables the reader to find information in an easily accessed format.

The methodology tree has as its root the "knowledge source," which is differentiated into judgmental methods versus statistical methods, based on the availability of sufficient objective data. Judgmental methods are differentiated into those that forecast one's own behavior versus those in which "experts" predict the behavior of others. Five of the 11 specific forecasting methods follow on the judgmental side: role playing, intentions, expert opinions, conjoint analysis, and judgmental bootstrapping. Statistical methods are differentiated into univariate methods versus multivariate methods, which lead to chapters on specific forecasting methods such as extrapolation models and multivariate models. The methodology tree gives a very useful way of organizing the field, and facilitates accessing the particular area of interest, e.g. rule-based forecasting, as well as tracing the linkages of this area to other areas.

The forecasting principles Web site was originally created to promote interaction of the authors and the reviewers. The Web site has been expanded and continued. It provides access to background papers and articles referred to in the Handbook, as well as access to publications that have appeared since the handbook was published. As such, it makes up an exemplary addendum to the Handbook.

Returning to the Handbook as a whole, one would expect some unevenness between the chapters in a multi-authored volume as comprehensive as this. Most chapters reflect the expertise of the authors and the rigors of the review process: a rigor beyond that of many peer-reviewed journals. A few chapters, e.g. Rowe and Wright on the Delphi technique, suggest a lack of familiarity with the critical literature.

There are a few weaknesses in the Handbook. One might be surprised by the scant attention paid to the "political" dimension of forecasting, a dimension touched on at pages 449-450. The relevance of this political dimension is in the foreground today, in light of the Enron debacle and the failure to forecast that collapse after August 2000. But it is not just failures to forecast politically sensitive topics that warrant more attention to this dimension. It is the emergence in America's hinterland of political movements promoting "resistance" to forecasting methods such as the Delphi technique that demands such attention [see, for instance, Eakman (1991, 1998), Kjos (1995), and Studer (1998)].

In sum, *Principles of Forecasting* is a very handsome volume. It will be a welcome addition to any applied research library, and it should be kept near at hand by any statistician.

References

Eakman, B. K. (1991) *Educating for the 'New World Order,'* Portland: >Halcyon.

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