■ ANDREW RUPPEL, Feature Editor, McIntire School of Commerce, University of Virginia

Serious About Time Series

by Andrew Ruppel, Feature Editor

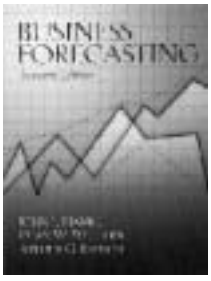
When called upon to forecast, good decision scientists strive to pick the right approach for the data available and the need at hand. The really good decision scientists will employ several approaches so as to triangulate on the best answer (which seldom is the same as the actual outcome). Even if they are unable to employ multiple forecasting approaches, decision scientists are sensitive to the pitfalls in relying on just one method to discern what may lie ahead. Natural scientists, in contrast to decision scientists, often need to forecast *backwards*. In forecasting backwards, the same principle holds, namely, use multiple methods. Here are some recent books that illustrate this principle.

Business Forecasting (4th ed.)

by Wilson & Keating

McGraw-Hill, 2002, 412 pages.

www.mhhe.com



Business Forecasting (7th ed.)

by Hanke, Reitsch, & Wichern

Prentice-Hall, 2001, 498 pages.

www.prenhall.com

BOTH THESE BOOKS COVER PRETTY MUCH THE SAME GROUND and methods, emphasizing a practical rather than theoretical approach. Both are written by an experienced set of authors and are outgrowths of previous editions. Both employ software extensively to process numerous real-world data sets. Both provide a review of basic statistics. Both offer considerable end-of-chapter material. Both appear weak on the issues of outliers and turning points. Overall, the differences are not great and a forecasting instructor would not go wrong no matter which one of these two books was chosen as the course text. The choice probably would boil down to which statistical software one prefers. Here are some additional observations about each text.

Wilson & Keating's text has nine chapters and they use a car sales data set plus an integrative case (The Gap) across eight of the nine to illustrate the different forecasting methods discussed. Interspersed among the text are comments by practitioners, which nicely demonstrate the extent of current forecasting efforts. For their fourth edition, the authors continue use of an Excel-based software package (ForecastX™) to generate the printouts for the text (curiously labeled as "Audit Trails"). Wilson & Keating encourage the use of a holdout sample to test the predictive capability of a candidate approach. Root Mean Square Error appears to be their preferred forecast accuracy measure. Their exposition on the basics of ARIMA methods is helpful. Dummy variables are treated only in the context of dealing with seasonality.

Hanke, Reitsch, & Wichern bundle a variety of cases (totaling 24 by name, 46 when the parts are separately counted) at the end of each of their eleven chapters. Most of the computer printouts in the chapters and cases are from Minitab; Excel usage demos appear only at the chapter ends. The best-subsets method to multiple regression is considered, but the authors refer to a Draper & Smith put-down of that approach as avoiding hard thinking about the regression variables. Dummy-variable use beyond that for capturing seasonality is considered. Gompertz and Logistics models get a nod. The back of the book is padded with data sets too lengthy to enter and most users would now download them from the publisher's Web site.

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Measuring Eternity
By Martin Gorst

Broadway Books, 2001, 339 pages.

www.broadwaybooks.com

MULTIPLE METHODS ARE THE ESSENCE of the many attempts to determine how old the earth and the universe are. Science writer Gorst's account begins with Bishop Ussher's calculations involving chronologies in the Bible and records of ancient history. Ussher's backcast of the earth's beginning was 4004 BC. He even set the time and date: 6 PM on Saturday, October 22nd. Made in the early 17th century, this firm pronouncement came under scrutiny by religious and secular scholars trying to reconcile it with historical records of non-Western civilizations. With the growth of the sciences, the "date of the beginning" question took on a new form as each discipline tried to outdo the other in perfecting a method to estimate the age of the earth. Conflicts within and across the disciplines arose, particularly as some methods put the earth older than the universe—a clear contradiction.

The geologists were among the first to enter the backcasting contest. They tried to use the rate at which the earth cooled. At least one experimenter (Buffon) literally got his hands burned trying to estimate what that rate was. Rates of erosion and salinity build-up were also computed and used to extrapolate in reverse. But as would be the case with other methods that relied on computing rates of change and working backwards, there were always doubts that the rates computed had remained constant over the very lengthy interval they had to cover. Time after time, new evidence or theories would arise casting doubt on the supposed constancy of the often cleverly calculated rate of change of some physical property.

Many of the big guns of 18th and 19th century science were involved in the quest to pin down the age of the world and the stars up in the heavens. Darwin committed a computational *faux pas* on the earth's age, causing him such embarrassment that he would shrink from subsequent efforts. Rutherford and Kelvin debated extensively on the nature of radioactive decay—which would become the basis for radiometric dating, now the preferred backcasting tech-

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Future DSI Annual, International, & Regional Annual Meetings

NATIONAL ANNUAL MEETINGS

November 23-26, 2002
The San Diego Marriott Hotel & Marina
San Diego, California

November 22-25, 2003
The Marriott Wardman Park Hotel
Washington, DC

November 20-23, 2004
The Boston Marriott Copley Place Hotel
Boston, Massachusetts

November 19-22, 2005
The San Francisco Marriott (Downtown)
San Francisco, California

November 18-21, 2006
The San Antonio Marriott Rivercenter/
Riverwalk Hotels
San Antonio, Texas

7th INTERNATIONAL MEETING

(Combined with the 2003 Asia-Pacific Regional Meeting)
July 4-8, 2003
China Europe International Business School
Shanghai, China

REGIONAL ANNUAL MEETINGS

Asia Pacific:
July 24-27, 2002
Le Royal Meridien Hotel
Bangkok, Thailand

Midwest:
March 27-29, 2003
Marcum Conference Center
Miami University
Oxford, Ohio

Northeast:
March 27-30, 2003
The Westin Hotel
Providence, Rhode Island

2004
Atlantic City, New Jersey

Southeast
February 26-28, 2003
Colonial Williamsburg Woodlands Conference Center
Williamsburg, Virginia

2004
Charleston, South Carolina

2005
Hilton Head, South Carolina (tentative)

Southwest:
March 4-8, 2003
Hyatt Regency Houston Hotel
Houston, Texas

March 2-6, 2004
Orlando Hyatt
Orlando, Florida

March 8-11, 2005
San Diego Town & Country Resort
San Diego, California

2006
San Antonio, Texas (tentative)

Western:
April 15-19, 2003
Kauai Marriott Resort and Beach Club
Lihue, Kauai, Hawaii

Submission

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1. An initial screening by the editor to determine the suitability of the article for the journal. Suitable articles are assigned to two or three referees, according to their functional and methodological content. If the manuscript is deemed inappropriate for the journal because it is not a match for the *Decision Sciences Journal of Innovative Education's* audience or mission, it will be promptly returned to the author.
2. A careful review by the referees, each of whom makes a recommendation to the editor and provides comments for authors.
3. An appraisal of the reviews by the editor. If the editor feels the paper has potential for publication, the author is invited to make revisions, following the suggestions of the reviewers.
4. Upon receipt of the revisions, the editor will make a final decision. The editor will appraise the entire review process, making sure that all revisions suggested by the referees have been addressed.

The editor reserves the right to deviate from the above procedures when the situation warrants and as it is deemed appropriate. ■

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nique for earth-bound materials. As to the age of the universe—it is intimately linked with the distance question. Just how big is the universe? Astronomers and astrophysicists searching for answers here found their work complicated by the realization that the universe apparently is expanding! Thus, they, too, were plagued by the rate-of-change issue. Hubble's Constant wasn't constant.

Given these various scientific attempts to pinpoint the age of the earth and stars, where do we stand? Currently the thinking is, given a plus/minus error of 1.6 billion years, that the universe is estimated at around 13.4 billion years old, with the earth about half that. Gorst's account of how we got to this estimate is engagingly written and supported with 18 pages of notes and references, plus occasional illustrations. Each of its 14 chapters has a teaser opening, followed by a biographical-like treatment of the characters, and closes out with a recap and lead-in to the next episode. A delightful read. Highly recommended. ■