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BOOK REVIEWS

OTHMAR W. WINKLER, *Interpreting Economic and Social Data: A Foundation of Descriptive Statistics* (Berlin, Germany: Springer, 2009, ISBN 978-3-540-68721-4, pp. xvi, 265).

Opening this book by Othmar Winkler is like splashing oneself with cold water at 5:30 in the morning. It's a wakeup call! The author lays out his "call to arms" in the preface. In our quest to understand or "make sense of socio-economic data" (p. vi), we have come to rely too heavily on statistical inference (F, t, Chi-square) and on assumed symmetry and continuity. If we seek insights, we are enjoined to adopt instead the descriptive tools of statistics and apply them to aggregate observations and their categorizations. To understand socio-economic phenomena, it is essential to recognize that the contributing processes are purposeful and not random.

Winkler appropriately observes that inferential statistical methods rose to prominence in the natural sciences. But these methods are typically ill-suited when adopted to grapple with socio-economic data. He takes pains to point out the limitations when directly transporting inferential statistical methodology to economic and social data. Among the more readily identified differences is the fact that social science data occur over time and location and are subject-specific. Insight into the data generation process commands that the observer consider the data's uniqueness to each of these factors.

Games of chance are offered as an ideal setting for the probability calculus. The rules of the game are known and cannot change during the game. The trials are repeated identically, and outcomes can be identified and predicted over the long run. Economic games, in business for example, are very different animals. Essentially, none can be accurately described as being repeated under stable conditions with known outcomes and subject to long-term predictability. Over time, conditions change, cooperation may develop, and new options typically emerge. Outcomes are multidimensional. Perturbations and changes over time present serious difficulties for aggregation into a single measure of success. Indeed, success is likely to be a vector, not a datum. Winkler writes, "It simply goes too far to view economic processes as random experiments" (p. 3). One need only cast an eye as far as the tightly controlled economies of the former European Soviet-bloc countries, says Winkler (p. 187), to observe the lack of randomness. Could we deny government influence even in market-based economies? He observes, "Rather [chance] resides in the observer's difficulty, inability or lack of interest to understand the deterministic causal system that actually is at work" (p. 189).

Of equal if not greater importance is the fact that randomness plays a very different role across disciplines. In games of chance and in the sciences, randomness is captured by the probability calculus. It underlies experimental design. In the socio-economic world, the remaining "random" observations after appropriate aggregation and classification often are what are of most interest, because the objective is to understand the process generating the observations. In addition, and again as the author points out, there are "[v]ery few statistical observations … made directly by an objective outside observer" (p. 5) essential to the randomness assumption.

Accountants will discover in Chapter 11 that many of the statistical tools favored by the author have been and continue to be used in accounting. He points out that the collection, classification, and aggregation (and de-aggregation) of data that are involved in preparing the balance sheet and income statement are simply standard statistical estimation processes. The data can then be analyzed horizontally or vertically, as is typically taught to students. The consideration of the time-series nature of the properly categorized measurements leaps out at the reader. But the complexities of the traditional statistical analysis of trend, seasonal, and randomness are avoided. Inventories, sales, and income all yield to simple but different descriptive approaches. The observed extensive reliance on ratios in both accounting and financial analysis is a natural application of the descriptive statistical techniques extolled by the author. In addition, methods for improved ratio analysis are noted. The interested reader is left with the discovery of additional connections as well as a brief digression into auditing. With the exception of budgeting and record keeping, management accounting is ignored, a limitation for accountants but of minor importance to the text.

The author exhorts his readers to use descriptive statistical tools to understand, evaluate, and interpret social and economic activity (e.g., business formation, entrepreneurship, pricing, trade, production, poverty, and so on). He would have one's tool kit packed with the proper use of ratios, appropriate graphing and

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tabling presentation techniques, and frequency tabulations (including their use to disclose easily understood measures of dispersion). He urges us to aggregate and classify data as a means of understanding socio-economic phenomena, thereby allowing for the less tractable and measurable aspects of reality to be captured and interpreted. And, if I may, we should all adopt a critical mindset when evaluating the application of inferential statistics to the socio-economic literature which we read or disseminate. I believe the author would approve of the insights that Professors Steven D. Levitt and Stephen J. Dubner bring to investigating interesting topics in the social sciences, which have been widely popularized in their books, *Freakonomics* (2005) and *SuperFreakonomics* (2009).

The book contains many examples typically gathered from a career of studying, researching, and consulting that describe the problems of forcing an analysis into the statistical inference mold. One example that appears in Chapter 9 and several other chapters, including the author's "Afterthoughts" (pp. 229–232), describes a study using regression analysis for a trial centered on male/female pay differentials. When the results appeared to be counter-intuitive, the explanation resided in the socio-economic nature of the data. The interpretation of the slope coefficient had to be interpreted in the light of the changes in the data over time rather than as simply the average change in X for a unit of change in Y. The chapter examines many of the limitations of regression analysis as typically applied to socio-economic data.

The author suggests that our reliance on the inferential aspects of mathematical statistics comes from its elegance and our own desire to be able to run with the elite. In our research, there seems to be a quest for mathematical sophistication, as exemplified by advanced modeling and mathematical testing to satisfy reviewers. We as instructors find statistical inference more exciting to teach and more likely to reap the admiration of our colleagues. The author also points to the academic hiring function as seeking those with expertise and interests devoted to statistical inference where the random sample is king.

The guilt lies heavily with those of us who have authored or teach from the standard statistical texts. Too often we have not only undervalued the direct relevance of descriptive methods, but also have failed to identify, let alone appreciate, the inherent limitations underlying the applicability of assuming randomness and the associated applicability of statistical inference.

This book does not fit easily into most schools' curriculum. However, this result is to a large extent a problem with those schools' curriculum rather than with the book's subject matter. It is a short volume consisting of 12 chapters and less than 150 pages of text. The text is augmented by enough text notes—often containing their own rewarding gems—to recall the *Principles of Economics* text written by Alfred Marshall (1890) that many of us were required to digest in our economics classes. (By the way, Marshall respected mathematics but did not want it to dominate economics.) Many examples, culled from Winkler's extensive writings and experience, are sprinkled through the text and the aforementioned notes. Most of these are from another era, which makes them no less relevant today. The writing is clear, if wordy. (The author feels repetition is useful for those who may wish to use portions of the volume without missing the essence of the argument.)

Indeed, statistics classes might be more exciting if students were given questions or issues to investigate, similar to the pay example explored by the author and described in some detail in Chapter 9. Discovering methods that yield insights and that reveal the limitations of investigative techniques might be rewarding and actually fun. Accounting professors: take note.

If your school or department has a seminar that dwells on the philosophy of science, treats research techniques in the social sciences, or just reviews research studies using statistics, then a reading of portions (or all) of this book would be both appropriate and desirable. If not, I would urge the Dean (or Department Chair) to provide each professor, instructor, and doctoral student, regardless of their field of study, a copy at the holidays and then hold an exam the day before classes begin.

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MAS R. DYCKMAN *Emeritus* Professor of Accounting *Cornell University*