Nate Silver, The Signal and the Noise: Why So Many Predictions Fail—But Some Don't

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informal payments that do not appear in official statistics.

Perhaps the biggest harm done by politically administered prices occurs because they prevent entrepreneurial physicians and hospitals from bundling and repricing their services in ways that benefit patients. Even though a Medicare patient may have diabetes, congestive heart failure, and high blood pressure, Medicare will pay the full fees for treating only one condition per visit. Patients and physicians who find it more efficient to take care of everything in one visit may not do so unless the physician can afford to give his time away.

When third-party payers do not control pricing or practice, as is the case in markets for cosmetic surgery, vision correction surgery, and cash-only surgical procedures, physicians interact directly with price-sensitive customers. Over time, they have adjusted their services in order to attract patients. Prices have plummeted. The real price of LASIK surgery declined by 30 percent in the last decade. Patients heal faster, outcomes have improved, and advances in technology have propelled an expanded range of treatment options. Further evidence of the importance of freeing suppliers comes from the rapid growth of primary-care retail clinics, the price and quality competition in the segment of the U.S. hospital market that caters to cash-paying foreigners, and the development of markets for international medical tourism.

The chapters on how health insurance works, and the considerations guiding the design of optimal health insurance, are among the most valuable aspects of this book. They review the idiosyncratic history of the development of current health coverage, discuss optimal terms of entry into an existing insurance pool, the optimal terms of renewal, and considerations surrounding the proper allocation of financial responsibility between third-party insurance and self-insurance. In general, third-party payment works best when it is deployed for cases in which the occurrence of medical expenditure is not under individual control, the price of third-party insurance is consequently low, and the exercise of individual choice does not create risks for others.

The final chapters emphasize the importance of a "Do-No-Harm" approach to health policy. They detail the Medicare and Medicaid reforms that would be dictated by a concern for providing proper economic incentives, and discuss the provisions of the new health-care law that discourage work, discriminate against the sick, enable fraud, and reduce incentives to innovate.

Goodman adeptly presents the case for basing health-care reform on the principles of economics. Readers interested in the current health-care policy debate will also find *Priceless* an excellent guide to its major contours.

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The Signal and the Noise: Why So Many Predictions Fail—But Some Don't

By Nate Silver. 2013. New York, NY: Penguin Press. Pp. 534. $27.95 hardcover.

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Why should business economists read a book about seismology, climate change, Texas hold 'em poker and flu epidemics? First, because Nate Silver tells entertaining and compelling stories about all of these subjects. Second, because all of these discussions, and many more, contain useful messages for economic modelers, forecasters, and analysts.

The first chapter, "A Catastrophic Failure of Prediction," covers ground close to home—the failure of the bond-rating agencies and many economists to see the bursting of the housing bubble and subsequent recession, even after it was under way. Silver follows this account with a discussion of political polling and punditry and tales of successes in predicting which baseball players would do well in the major leagues. (Silver is well-known now for his *New York Times* column and blog, "FiveThirtyEight," which focuses on election polls, but first achieved recognition for inventing a system of analyzing baseball statistics.)

As Silver explains in the Introduction, his purpose in drawing on these diverse fields is to "get

you thinking about some of the most fundamental questions that underlie the prediction problem. How can we apply our judgment to the data—without succumbing to our biases? When does market competition make forecasts better—and how can it make them worse? How do we reconcile the need to use the past as a guide with our recognition that the future may be different?" (p. 16). Each of these questions gets thoughtful treatment, particularly in a chapter on economic forecasting, "How to Drown in Three Feet of Water."

In every field he delves into, Silver dives more than three feet deep, sources his research meticulously, and adds his own analyses. For instance, in text and endnotes, he presents several plots and statistical tests he performed on forecasters' predictions regarding unemployment and real GDP. (The book contains over 1,000 endnotes, encompassing a huge range of citations from scholarly books and journals, as well as popular sources.) He also weaves in accounts of interviews he conducted with both notable and less heralded names. (Among the economists: George Akerlof, Hal Varian, Jan Hatzius, Lawrence Summers, Jeffrey Sachs, and Robin Hanson.)

In Silver's view, economists fail to make clear that their forecasts rely on data that they know—or should know—are uncertain and likely to be revised. Even when they offer a range of outcomes, they do not assign a high enough probability to extreme (but not unprecedented) results. "In December 2007, economists in the *Wall Street Journal* forecasting panel predicted only a 38 percent likelihood of a recession over the next year. This was remarkable because, the data would later reveal, the economy was *already in recession* at the time. [emphasis in original] The economists in another panel, the Survey of Professional Forecasters, thought there was less than a 1 in 500 chance that the economy would crash as badly as it did" (p. 33).

After reviewing how widely and often economic forecasts miss the mark, Silver acknowledges, "This property of overconfident predictions has been identified in many other fields, including medical research, political science, finance, and psychology….But economists, perhaps, have fewer excuses than those in other professions….Economic forecasters get more feedback than people in most other professions, but they haven't chosen to correct for their bias toward overconfidence" (p. 183). He asserts, "one can plot the error made in annual GDP predictions by the Survey of Professional Forecasters against a time trend and find that there has been no overall improvement since 1968" (endnote 51, p. 481).

Silver is also critical of economists who use models with an excessive number of explanatory variables, saying, "they can talk themselves into believing that…anything that has any semblance of economic meaning" can be a useful leading indicator. "With so many economic variables to pick from, you're sure to find something that fits the noise in the past data well. It's much harder to find something that identifies the signal; variables that are leading indicators in one economic cycle often turn out to be lagging ones in the next" (pp. 186–187).

Unfortunately, Silver's messages for economists are somewhat mixed. One is that "A forecaster should almost never ignore data, especially when she is studying rare events like recessions…, about which there isn't very much data to begin with. Ignoring data is often a tip-off that the forecaster is overconfident, or is overfitting her model—that she is interested in showing off rather than trying to be accurate" (p. 191). But just three paragraphs later, he concedes that a "rationale you'll sometimes hear for throwing out data is that there has been some sort of fundamental shift in the problem you are trying to solve. Sometimes these arguments are valid to a certain extent: the American economy is a constantly evolving thing and periodically undergoes structural shifts…An economic model conditioned on the notion that nothing major will change is a useless one. But anticipating these turning points is not easy" (pp. 192–193).

In discussing the often large revisions in data on which economic forecasts are based, Silver delivers another mixed message. "So we should have some sympathy for economic forecasters" (p. 194). He immediately tempers this sympathy in an endnote to the same sentence: "Although economists often do not give enough attention to the distinction between real time and revised data when they present their forecasts" (endnote 50, p. 481).

Perhaps surprisingly, after showing the wide errors and lack of improvement over time in economists' forecasts, Silver advises, "If you're looking for an economic forecast, the best place to turn is the average or aggregate prediction rather than that of any one economist. My research into the Survey of Professional Forecasters suggests that these aggregate forecasts are about 20 percent more accurate than the typical individual's forecast at predicting GDP, 10 percent better at predicting

unemployment and 30 percent better at predicting inflation" (pp. 197–198).

Without exonerating forecasters, Silver also recognizes their customers "have to be better consumers of forecasts. In the case of economic forecasting, that might mean turning the spotlight away from charlatans with 'black box' models full of random assortments of leading indicators toward people like Jan Hatzius of Goldman Sachs who are actually talking economic substance. It might also mean placing more emphasis on the noisiness of economic indicators and economic forecasts. Perhaps initial estimates of GDP should be reported with margins of error….More broadly, it means recognizing that the amount of confidence someone expresses in a prediction is not a good indication of its accuracy—to the contrary, these qualities are often inversely correlated. Danger lurks in the economy and elsewhere, when we discourage forecasters from making a full and explicit account of the risks inherent in the world around us" (p. 203).

Silver's concluding advice: Think probabilistically, not as if only one outcome is certain. Know what your prior beliefs are and where they are coming from, so you can guard against, or at least recognize, biases in your forecasts. Make a lot of forecasts—it's the only way to get better. Recognize that "our bias is to think we are better at prediction than we really are. [May we be] a little more modest about our forecasting abilities, and a little less likely to repeat our mistakes" (p. 454).

Readers hoping for a Silver bullet for producing bull's-eye forecasts may be disappointed. But at least they'll have enjoyed a thought-provoking read, not just a serving of Silver platitudes.

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