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# Review: *Actuarial Excel: Data Analytics and Applications*

By Dave Snell

Excel is ubiquitous in actuarial work. We use it for pricing, reserve calculations, merger and acquisition analysis, experience studies and other situations where actuaries once used a paper spreadsheet. Admittedly, other very specialized and highly sophisticated tools have emerged for some of these tasks, but invariably we encounter the odd product, cohort or ad hoc situation that does not fit into these other tools, and the first thing we reach for to solve the issue is Excel. It is little wonder, then, that prospective employers expect a student entering an actuarial career to have facility with this wondrous tool. Yet, gaining facility in Excel for actuarial work can be a daunting task. The program has myriad capabilities, and Excel textbooks often run 1,000 pages or more and cover many capabilities of little use to actuaries, while they lack the emphasis and depth on the analytic capabilities needed in our actuarial work.



Maryville University professors Guangwei Fan, ASA, MAAA, Ph.D.; Guodong Li, FSA, MAAA, EA, Ph.D.; and Jinfeng Wei, Ph.D., have created a supplement to their very popular classroom lessons that I believe is a game changer for holistic education. Traditionally, the paradigm of university instruction has been to have a lecturer in front of the class imparting the wisdom of experience in a mostly single-direction communication process. Students dutifully take notes and later try to make sense of them. It worked for several hundred years, so there was little impetus to change the setup. More recently, however, that traditional approach has come under attack from the Khan Academy, MOOCs (Massive Open Online Courses) and the dozens of sites with video lessons available on the Internet. Several leading and prestigious universities have endorsed this shift. One drawback of MOOCs and similar delivery vehicles, though—and I write from personal experience—is that occasionally the student has a question and wants to have a helpful and knowledgeable human mentor to guide him or her around some obstacle that is blocking further progress, and these online channels do not provide such a source.

*Actuarial Excel: Data Analytics and Applications*, developed by these three dedicated teachers, is a comprehensive package that includes audio, video, written and hands-on components to facilitate the learning process. There are video-on-demand overview lessons for each chapter; interactive class exercises on Excel workbooks that the student can use, inspect and modify as desired; links to homework assignments and review quizzes; and proven exercises and lessons from their classroom teaching experience of this material over the last several years.

I started using Excel when it first came out in 1985, and as a long-time user of its predecessors (Multiplan, Quattro, Lotus 1-2-3 and VisiCalc), I was a power user from the beginning. The introduction of a true programming language (beyond the keystroke macros) in Excel 5.0 (1993) was a revolutionary advance. Over the ensuing years, I created hundreds, if not thousands, of spreadsheet applications, and some are still in use in multimillion-dollar, and sometimes even multibillion-dollar, scenarios. I relate this background to emphasize that I am used to pouring through Excel textbooks and searching for the few new features I could add to my repertoire—always looking for more arrows for my quiver of spreadsheet-related tools.

My pre-review expectation of this package was that it would cover the basics and then perhaps some VLOOKUPS and possibly INDIRECT statements as the advanced material for actuarial analysis. I was wrong! One of the first video segments I watched involved creating a list of students, sorted by test scores. My first inclination would be to take the original list and use Excel's data sort capability. This is easy, but it has the drawback of being a manual operation and thus not as easily reproducible or auditable by others. Next, I might have put the sort commands into a

VBA macro, but that would require the workbook to be saved as an .xlsm file instead of the more common (and trusted) .xlsx file, and some company security controls discourage the use of these files. Instead, the authors showed a clever use of a combination of the RANK, INDIRECT and MATCH functions that accomplished the task with none of these concerns. That is just one example, but it shows the forethought and emphasis on best practices evident throughout the book and the interactive course.

Continuing to focus on the student, the videos are professionally prepared in short-duration lesson supplements, and the voice accompanying them is that of a native-born American speaker (the daughter of one of the professors) in clear, unambiguous English, with the unmistakable cadence and tone of a fellow student. The authors have made every effort to facilitate the learning process.

These Maryville professionals have upped the ante on teaching effectiveness by embracing a reversal of the longtime process. Instead of lecturing from a lectern and leaving the students to go figure out what they said (or meant to say), they supply the multimedia package for the students to explore at times and places more convenient for them, and they extend the learning process by answering the questions each student has from self-exploration of the package. I see high potential for this pack-

age as the core content of what could turn out to be an excellent MOOC, and that could be a future offering from Maryville. In the interim, though, the on-site students get the best of all worlds! The prepared text, videos and Excel workbooks form a wonderful self-study package that addresses the typical questions students have asked over the last several years. In addition to this prepared material, classroom students have the benefit of personally asking the authors about any finer points or any ideas triggered by these lessons and getting the insights of a personal mentor.

I recommend this educational bonanza for all actuaries and students—those currently pursuing a formal actuarial science or related degree at a university and those who want to hone their professional skills in Excel for more effectiveness in their daily work. I commend the Maryville University faculty and administration for advancing the state of actuarial education. ■



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