DISTINGUISHED ACADEMIC ACTUARIES

An Interview With Esther Portnoy

Esther Portnoy, Ph.D., is a retired professor of actuarial science who spent most of her career in the Mathematics Department at the University of Illinois at Urbana–Champaign (UIUC). She earned her B.S., M.S., and Ph.D. degrees from Stanford University. After returning to the Midwest in 1974, she joined UIUC, where she was employed in various capacities. Esther later attained her FSA designation and became director of UIUC's actuarial program in the 1980s. In addition to teaching classes and advising students, Esther worked hard to secure financial assistance for UIUC's actuarial science program, culminating in the establishment of the State Farm Companies Foundation Scholarship program. She was named the first State Farm Scholar at UIUC in 2003, retiring soon after in 2004. She was among the first associate editors of the *Journal of Actuarial Practice*, in 1993.

Q: Tell us about your background. How did you enter the actuarial profession?

A: My Ph.D. thesis was in differential geometry and not much of an asset in looking for a job. My husband suggested an advanced statistics course. Then the director of the actuarial program at Illinois, Ken Appel, suggested that I sit for what was then the second actuarial exam. I breezed through that, and with Ken interested in devoting more time to other areas (such as the four-color theorem), I was encouraged to continue. Once I was an ASA, the job market opened up.

Q: What challenges did you encounter upon entering the actuarial profession?

A: The exams, beyond the first few, were no triviality for someone who hadn't sat for anything like that in almost 10 years. The math department was eager to have someone take over the teaching and advising responsibilities for the program but was almost clueless about what constituted research and where it might be published.

Q: Who was an influential person in your professional life and why?

A: Ken Appel, as I've already mentioned. Also, Dick Bayles, who chanced to be our neighbor across the street in Massachusetts; he cosponsored my ASA application.

Q: What was your personal philosophy with regard to teaching? To what extent did professional actuarial exams influence your teaching?

A: I really tried to convey to students how much fun and how exciting it can be to master new material. I tried to challenge the best students while not overwhelming the second tier. But the need for them to pass exams certainly meant plenty of emphasis on fairly quick and accurate solutions to problems—lots of homework of a fairly routine sort.

Q: What was your personal philosophy with regard to actuarial research? Was your approach "practical," "theoretical," or a combination, and why?

A: With my math background and limited business experience, my research was almost entirely theoretical. I still enjoy the

challenge of a mathematical problem, whether it has any practical application or not.

Q: Looking back, would you have welcomed greater input from or communication with members of the business community to indicate possible areas of research likely to be of particular value or practical interest to them?

A: Probably not. I guess I was, and remain, mostly a mathematician who found the business side somewhat interesting but not central.

Q: Looking forward, do you feel that members of the business community should be given greater opportunities to familiarize themselves with the latest academic research and to benefit from it? If so, how do you think it should be done?

A: I suspect that members of the business community have plenty of opportunities in this regard—probably more than they want (or perhaps need) to act on.

Q: What would you tell or advise someone considering entering the actuarial profession?

A: What I always said to inquiring students: This is a great career for the right person, but it's not for everyone. Be prepared to work really hard. If you don't love it after a year or two of work or classes, look for something else.

Q: Thinking back on your career, what are your biggest accomplishments? Any memories or moments that stand out above the rest? Any disappointments?

A: The program at Illinois grew considerably under my direction, and I believe I left it in good hands. I have been away for quite a while and don't hear much about how things are going now. A few former students are still on my mailing list for end-of-year holiday letters. I'm sorry I never made full professor—not enough research to satisfy my department.

Q: What might someone be surprised to know about you?

A: I am now happily helping care for our youngest grandson, volunteering at a food pantry and other hunger-fighting programs, and working at my daughter's office—preparing income-tax returns is fun! They would probably not be surprised to know that I work on British-style cryptic crosswords, the NPR Sunday puzzle, and many others. ∎

As a follow-up to the article "University of Nebraska–Lincoln Invites You to ARC 2020," in the previous issue of *Expanding Horizons*, we would like to note that the 2020 Actuarial Research Conference will now be hosted on a virtual platform. The College of Business at the University of Nebraska–Lincoln made this decision due to the uncertainty of COVID-19, travel restrictions, and an abundance of caution for the safety of those involved. The virtual conference will be hosted on August 9–12.

Introductory Seminar on Actuarial Science at the University of Cincinnati

By Joanna Mitro

In 2016, I partnered with colleagues at the University of Toledo and Youngstown State University to compete for scholarship funds from the State of Ohio that we would use to recruit actuarial science students. The program we designed (The Ohio Actuarial Science Consortium) was funded as part of Ohio's Choose Ohio First Scholarship Program. Our consortium introduced enhancements to strengthen our existing programs, such as sharing presentations by local actuaries via WebEx, forming actuarial advisory boards, expanding mentoring, job shadowing and internship opportunities, and incorporating authentic problems, case studies, and projects into the curriculum. One of the enhancements I developed for the University of Cincinnati is a 2-credit hour introductory seminar aimed at freshmen and sophomore math majors interested in (or just curious about) actuarial science. That seminar is the subject of this article.

As in many institutions, the members of our consortium don't have a separate degree program for students interested in actuarial science. At the University of Cincinnati, students who aspire to become actuaries can follow the statistics and actuarial science track within the existing BA or BS degrees in mathematical sciences, and are advised about elective courses and resources supporting exam preparation and meeting validation by educational experience (VEE) requirements. We offer courses geared to Exams P and FM, provide exam-prep materials and reimbursement for passed exams, and arrange for students to visit a local insurance company each fall during our "Reading Days" break. Even so, most beginning math majors don't know much about actuarial science or what it takes to

become an actuary. The introductory seminar helps students get this information and assess their interest in actuarial science. For those who decide to go on with actuarial science, the introductory seminar enables them to set up a plan for achieving the goal of becoming an actuary.

Because the seminar has to be accessible to freshmen, no calculus knowledge is assumed. Instead, the seminar is designed around mini-projects that involve actuarial concepts and are carried out using Microsoft Excel. It includes curriculum and career information, advice on actuarial exams, an internship panel of students who have completed an actuarial internship, and several guest presentations by actuaries at local companies, on topics such as the analytics of pricing insurance, careers as a pension actuary, an actuarial perspective on life insurance and the actuarial profession and its impact on society. The seminar is open to any interested or curious student.

The seminar is organized around projects, with concepts and mathematical background introduced as needed to develop formulas and explain ideas. The use of Excel enables students to perform calculations for various actuarial scenarios and to observe the effects of changing parameters. The seminar (in its most recent iteration) includes these projects:

- **Pirate peril I and II.** Pricing a policy to protect ships from loss due to pirate attack, with and without frequency risk. Loss amount is fixed. I: the number of ships attacked is non-random and known; II: the probability of attack is fixed but the number of ships attacked is random. Introduces Excel formulas and conditional functions, relative and absolute references; employs simulation of random frequency (with Analysis ToolPak). Students create a dashboard.

- **Cell phone warranty.** Pricing a policy with random severity. Introduces continuous and mixed distributions, presents the SUMPRODUCT function and uses simulation of a gamma distribution.

- **Pivot tables.** In-class exercise and homework project with simulated insurance policy data. Introduces Excel tables; students produce pivot tables and charts, and write up a report summarizing their analysis.

- **Loss development.** Create a cumulative loss triangle using a pivot table. Students use "actuarial judgment" to select loss development factors and then use these to compute the required loss reserve.

- **Theory of interest.** Introduction to annuities and other payment streams and present value. Starts with an exercise to determine the amount of money needed to create an annuity that would pay for a child's future tuition (different tuition amounts at different grade levels, adjusted for price inflation) at an elite local private school. Students create a "financial calculator" in Excel to solve problems dealing with loans and savings plans, and create a loan amortization table.

- **Mortality tables.** Structure and meaning of the entries of a life table, with light introduction to conditional probabilities, using published tables and expected present value. Introduces VLOOKUP (to retrieve quantities from life tables for formulas). Applications of expected present value to pricing annuities and life insurance policies.

Some of these projects were inspired by presentations or projects developed by others.

In creating the seminar, I benefited from many sources, especially the presentations at the 2017 Actuarial Teaching Conference, discussions with my department's Actuarial Advisory Board, Adam Butt's "Introduction to Actuarial Science" course on edX, CAS Case Studies (available to CAS Academic Central members), old Excel labs from Purdue University's MA/STAT170 course and the help of 2017–18 senior capstone student (Katelyn Evans, now an actuary with Cincinnati Financial). Additional topics are envisioned for future development on topics such as reinsurance or interest rate risk.

The seminar appears to be meeting its goals:

1. Describe what actuaries do: where they work and what sorts of problems they work on.

2. Assess actuarial science as a future career option.

3. Establish a plan for meeting the requirements for becoming an actuary and securing an actuarial internship.

4. Complete mini-projects involving actuarial concepts.

5. Use Microsoft Excel to solve actuarial problems and explore properties of solutions.

Figure 1 shows some of the results from the student course evaluation the last time I taught the seminar. In addition to these results, over three-quarters of the students agreed or strongly agreed with the statement "I want an actuarial internship in the future and have a plan on how to go about securing one." Even those students who by the end of the course were unsure or had decided against pursuing actuarial science appreciated learning to use Excel and hearing about real-life applications of mathematics. Furthermore, 87 percent of students expressed

Figure 1
Course Evaluation Results
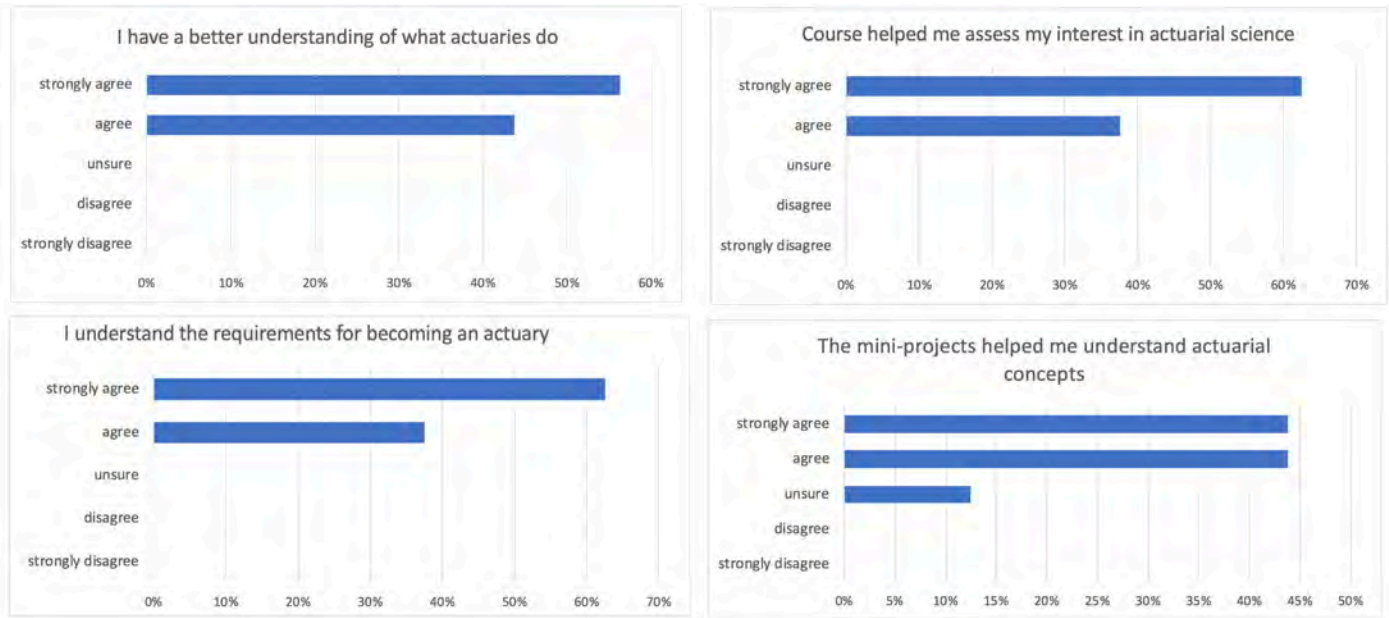
interest in taking a (not-yet-created) follow-up course that would involve more actuary presentations and more mathematically sophisticated and authentic projects.

I would be happy to share my materials with anyone interested in using actuarial-themed projects with students, especially those interested in improving and expanding on this enterprise. ■

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EDUCATION/RESEARCH MEETINGS

Inaugural Simon Conference for Young Researchers in Risk Management and Insurance

By Albert Cohen, Gee Lee, Thorsten Moenig and Frederi Viens

On Nov. 22–23, 2019, Michigan State University hosted the inaugural Simon Conference for Young Researchers in Risk Management and Insurance, with the purpose of promoting the exchange of new ideas and the research of young scholars in actuarial science, insurance economics, risk management and finance.

With their research presentations, undergraduate students, graduate students, post-doctorals, industry professionals and early career faculty members from 13 universities across the country contributed to the highly successful first installment of this conference.

There are few actuarial research conferences aimed at young researchers—and none that we could find that provide a space for undergraduate research to share the spotlight with researchers from the graduate level and above. We were very pleased to help fill this void.

It is also the case that for many students of actuarial science, their undergraduate years represent their only opportunity to engage in research on their own terms, in an academic setting. Thus, another motivation for setting up the Simon conference the way we did was to enhance research incentives and opportunities for every undergrad student in the insurance and actuarial space.

The approximately 70 conference attendees were treated to talks across a wide array of insurance-related topics: equity-indexed annuities, reserving, health care, property and casualty insurance, insurance economics, loss models, applied statistics and finance/banking.

The 19 contributed talks were complemented by a panel on career opportunities and three keynote addresses: Professor Kristen

Moore (University of Michigan) led off the conference on Friday morning with her work on retirement planning; on Friday afternoon, Jon Culbert (Delta Dental) brought to light the ethical ramifications of the current revolution in artificial intelligence and machine learning; and Jordan Giebas (Goldman Sachs) closed the conference on Saturday afternoon with a thorough discussion of what it means to be a "quant" in today's financial world. A dinner reception on Friday and several breaks between sessions gave conference participants opportunities to get to know their peers from other institutions and to network over their mutual research interests.

The conference was sponsored financially by the Michigan State University Actuarial Science Program and by the generous contributions of Ron Simon, former chairman and CEO of AutoOwners Insurance Company. This allowed the reimbursement of travel costs for all speakers and all undergraduate students who attended the conference. The conference was organized by Professors Albert Cohen, Gee Lee, Frederi Viens (Michigan State University) and Thorsten Moenig (Temple University).

The overall quality of the presentations was very high. This was all the more remarkable given that, for many students, this was the first opportunity to present their research in a conference setting and to a wider audience.

The conference organizers recognized the most (of many) outstanding talks with two Best Presentation awards. In the Undergraduate and Masters category, this award went to Anh Nguyen and Nicklaus Pomije from the University of St. Thomas (Minnesota). Anh and Nick are seniors double-majoring in actuarial science and statistics. Their talk, "Models of Economic Capital for Property and Casualty Insurance Companies," was based on a summer research project with their advisor Professor Arkady Shemyakin. In the Early Career category for PhD students and post-doctorals, the award went to Yuan (Sabrina) Du, a PhD student in risk management and insurance at Temple University, for her talk titled "Who Are the First-Movers? Evidence from the Structured Market Entry Model." Due to the large number of presenters in this category, the panel of evaluators also recognized two runners-up: Himchan Jeong, a Ph.D. student at the University of Connecticut ("Application of Bayesian Sensitivity Analysis in Compound Risk Model With Random Effects") and Wenchu Li, a Ph.D. student at Temple University ("Basis Risk in Variable Annuities").

Benefits for the participants included the aforementioned strengthening of ties between future professionals and academia, as well as wetting the appetite of current students for possible graduate education and research. Furthermore, the host

institution, Michigan State University (MSU), is recognized as a strong advocate of actuarial research at both the undergraduate and graduate levels and beyond. This conference provided MSU with a spotlight on this aspect of the work being done in its actuarial science and quantitative risk analytics programs.

The conference is accompanied by a special issue of *Risks*, titled "Young Researchers in Insurance and Risk Management." Conference participants and any other student researchers are encouraged to submit their completed research papers to these conference proceedings.

We hope the participants understand that our commitment to future risk management professionals is as strong as our commitment to current industry specialists. We will continue this unique approach of connecting young minds with industry professionals via research presentations, panels and keynote speakers. Our actuarial science and risk analytics community is a tight-knit one, and we are proud to support the connection between current and future risk management professionals with academia.

Given the success of the inaugural Simon Conference, the organizers hope to continue this effort in the future, with the next edition in fall 2021. Any feedback and inquiries may be directed to Albert Cohen and Thorsten Moenig. ■

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RESEARCH & REPORTS

The University of Nebraska-Lincoln's College of Business invites students, academics, and practitioners working in actuarial science, risk management, insurance, and related areas to attend the 55th Actuarial Research Conference (ARC) taking place Aug. 10–12, 2020. Due to COVID-19, ARC 2020 will be hosted as a virtual conference and will include presentations by renowned researchers with panel discussions on important industry issues. There will be extensive opportunities for virtual networking with other conference participants. Visit https://business.unl.edu/arc/ for additional details and to register for this event.

SECTION COMMUNITY

Our goal is to provide you tools and resources to support and encourage actuarial education and research. We have recently added new resources to assist actuarial educators who have had to quickly begin teaching online. Check out the Education and Research resources webpage to explore newly added resources for teaching online.

PROFESSIONAL DEVELOPMENT

Learn about various emerging business models of peer-to-peer insurance and digital concierge service, as well as potential applications to different areas of practice during the Peer-to-Peer Insurance and Digital Concierge Webcast on July 27, 2020. Register by July 23 to participate.

Sign up for the Innovations in Actuarial Education Webcast taking place on Aug. 19, 2020, to gain ideas and techniques that you can apply to your work to help prepare today's actuarial students for the changing workplace. Three experienced actuarial educators from three different universities will share their innovative approaches to teaching future actuaries. Register by Aug. 17 to participate.

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