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The Verdict on *Floridas* Tort Reforms

Meet the Candidates

The Next Wave of ILS: Casualty

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July-August 2024

departments

FSC LOGO

on the cover

The Verdict on Florida Tort Reform

By JOHN DIVINE

Find out what actuaries and consumer advocates are saying about changes in Florida tort law since 2022. Early results show insurers coming back to the state as a result – but consumer advocates say it comes at a cost.

Meet the Candidates

Get to know the potential future leaders of the CAS Board of Directors.

The Next Wave of ILS: Casualty

By JESSICA SCHULER

Until recently, most of the market didn't think casualty ILS was possible. Fast forward to today, (re)insurers are leveraging it for capital management purposes with plans to increase its use over the long term.

Take Time to Vote

Enjoy prize-winning essays on artificial intelligence. Take a deep dive into Florida tort reform. Explore casualty insurance-linked securities. Learn more about 2024 Spring Meeting sessions you might have missed. Meet the CAS Board Candidates. This edition of *Actuarial Review* runs the gamut!

In our cover story, John Divine explores why Florida presents significant challenges for insurers, and it's not solely due to natural disasters. The state's high litigation rates prompted a comprehensive reform of its tort law beginning in 2022, aimed at reducing legal expenses for insurers and making Florida a more appealing business environment. Preliminary outcomes indicate a return of insurers to the state; however, consumer advocates warn that this progress comes with drawbacks.

Our 2024 Spring Meeting coverage spans cyber resilience, an update on the dynamic property insurance and reinsurance markets after Hurricane Ian in 2022 and record-setting severe convective storms in 2023, and a preview of two of the five 2024 Race and Insurance Pricing research series papers to be published this summer.

We give you a sneak peek at the vision and backgrounds of our 2024 CAS Board Candidates, but I encourage you to learn even more by visiting casact.org/about/leadership-and-staff/elections/meet-candidates-2024. You will find biographical information and videos that give them a chance to outline their goals. Voting is crucial, as it directly influences the leadership and direction of the organization. The elected board members will make decisions that impact the association's policies, priorities and resource allocation. By participating in the vote, you ensure that your voice and interests are represented, contributing to a more democratic and inclusive governance structure.

On the human-interest side of this edition, you will also get the chance to meet one of our newest CAS staff members, Josie Harler, professional education manager, and Brandon Smith, FCAS, who helps bring the magic of Monographs to life.

Enjoy this edition and let us know what topics you want us to cover next at AR@casact.org! ●

Actuarial Review welcomes story ideas from our readers. Please specify which department you intend for your item: Member News, Solve This, Professional Insight, Actuarial Expertise, etc.

SEND YOUR COMMENTS AND SUGGESTIONS TO:
Actuarial Review
Casualty Actuarial Society
4350 North Fairfax Drive, Suite 250
Arlington, Virginia 22203 USA
Or email us at AR@casact.org

Follow the CAS

Obtain Your Credentials in Predictive Analytics and Catastrophe Risk Management From The CAS Institute
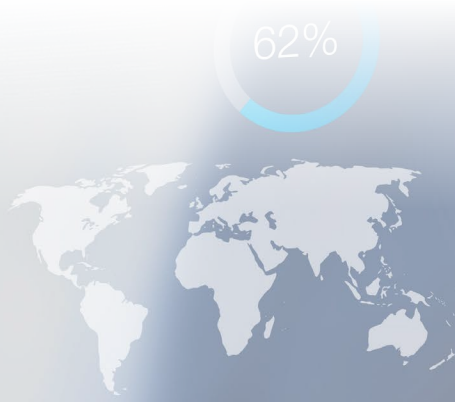
Certified Catastrophe Risk Management Professional (CCRMP) and Certified Specialist in Catastrophe Risk (CSCR)

The International Society of Catastrophe Managers (ISCM) and The CAS Institute (iCAS) have joined together to offer two credentials in catastrophe risk management. The Certified Catastrophe Risk Management Professional (CCRMP) credential is available to experienced practitioners in the field through an Experienced Industry Professional (EIP) pathway. The Certified Specialist in Catastrophe Risk (CSCR) credential is available both through an EIP pathway and an examination path.

Required assessments and courses for earning the CSCR include:

- Property Insurance Fundamentals
- Catastrophe Risk in the Insurance Industry
- Introduction to Catastrophe Modeling Methodologies
- The Cat Modeling Process
- Online Course on Ethics and Professionalism

Some exam waivers are available for specific prior courses and exams.

For more information, visit CatRiskCredentials.org.

Certified Specialist in Predictive Analytics (CSPA)

The CAS Institute's Certified Specialist in Predictive Analytics (CSPA) credential offers analytics professionals and their employers the opportunity to certify the analytics skills specifically as applied to property-casualty insurance. The program focuses on insurance as well as technical knowledge and includes a hands-on modeling project that challenges candidates to apply what they have learned throughout their studies to address a real-world scenario.

Required assessments and courses for earning the CSPA include:

- Property-Casualty Insurance Fundamentals
- Data Concepts and Visualization
- Predictive Modeling — Methods and Techniques
- Case Study Project
- Online Course on Ethics and Professionalism

Some exam waivers are available for specific prior courses and exams.

For more information, visit TheCASInstitute.org.

Start, Stop, Continue

I hope everyone has the opportunity to take a breath during these summer months. Some may have just finished a busy season of work or study, and some are graduating or celebrating milestones. Others are using a summer break as a halftime to review the first half of the year and make adjustments for the second half. In a few of the companies where I've worked, we use a simple "Start, Stop, Continue" framework to decide on what adjustments to make. I only have a few months left in my current position as president to make an impact, so allow me to share a potential list of "Start, Stop, Continue" items for the CAS.

The "Start" List
Getting regular feedback loops with important stakeholders

After candidates faced unexpected exam outages on May 1, our admissions volunteers, leaders and staff activated internal crisis management plans. We understood the candidates' frustrations after they spent months in preparation for their exam, as well as the concerns of their employers, so we sought to act quickly. Emails were sent to impacted candidates within hours of discovery and over a dozen emails went out to multiple stakeholders within 48 hours. Behind the scenes, there was an all-hands-on-deck effort by the collective Admissions team to determine a path forward and have it reviewed and approved by leadership.

We sincerely regretted this situation occurred and knew we needed to do better to provide a positive exam experience. So, in the subsequent weeks and months, we've identified opportunities both to prevent future situations like this as well as have a more robust contingency plan in the unlikely event anything similar happens in the future. While dealing with this issue, we received a lot of feedback concerning exams and communication, which led to recent meetings with both the Candidate Advocacy Working Group and the Employer Advisory Council. The impromptu post-exam dialog with these groups gave us invaluable insight into what they are seeing, feeling, and experiencing — and that is insight we need to tap into much more regularly in order to stay in touch. We are working on additional ways to have more frequent engagement with these important groups of stakeholders.

Utilizing more AI within the CAS

I am excited to share with you that the CAS is embarking on an initiative to explore how artificial intelligence (AI) can enhance our internal business operations. This strategic move aims to position our association at the forefront of technological advancements, ensuring we continue to deliver exceptional value to our members.

To guide this effort, we have developed a set of guidelines for our staff. These guidelines have been reviewed by our external IT security consultant, the CAS Risk Management Committee, and the Executive Council. This comprehensive review process ensures that we maintain strong standards of security and integrity as we integrate AI into our operations.

We have also established an internal group of staff dedicated to enhancing their skills in AI. This team has undertaken initial pilot projects, utilizing AI for various purposes such as marketing products, summarizing and synthesizing reports, generating ideas, taking notes and conducting business research. Their efforts are paving the way for more efficient and innovative business processes within our organization.

The market for AI products tailored to professional association business operations is rapidly evolving. To ensure that the CAS remains at the cutting edge of this trend, the Executive Council and staff leadership are collaborating closely to identify the best ways to leverage this emerging technology. Our goal is to harness AI's potential to strengthen our society and better serve our members.

The "Stop" List

This is the hardest of the three categories for me because there are many worthy efforts which are hard to say no to. However, if we prioritize everything, we prioritize nothing, and the most important issues don't get addressed. A great read, for those who are balancing ambitious goals and seemingly urgent everyday issues, is the classic *Harvard Business Review* article, "Who's Got the Monkey." For the rest of my term, my main item to stop is overcommitment, so I can focus either on my main CAS goals for 2024 or urgent CAS issues.

The "Continue" List

There are many projects going well that we should continue at the CAS.

Transforming Admissions

Within Admissions, we need to continue our planned rollouts, like the Prop-

erty and Casualty Predictive Analytics (PCPA) requirement for Associates, as well as continue planning for the future with the work on our Actuarial Professional Analysis (APA) project. See the separate article on the APA for more details.

Updating the Strategic Plan

CAS Board Chair Roosevelt Mosley has been leading our Strategic Plan Task Force, which has already received a lot of input from multiple focus groups and town halls in order to set the CAS Strategic Plan for the next few years. The Task Force has been working on a set of high-level priorities which should uniquely position the CAS to have a sustainable competitive advantage. This work will form the basis for the development of an operational work plan that is prioritized and consistently reviewed and revised by the Board and staff based on changes in the environment.

Engaging with other organizations

As mentioned in the "Start" list, we are strengthening our engagement with key stakeholder groups, including employers, candidates, and universities. At the same time, we should continue to work with all our relevant North American partner organizations, like the American Academy of Actuaries, the Society of Actuaries, the Conference of Consulting Actuaries, and the Canadian Institute of Actuaries. There are common themes that we face in our profession that we should continue to partner on. We should also increase our engagement with the National Association of Insurance Commissioners (NAIC) and will be

increasing our leadership presence at their meetings.

Connecting with members and other actuaries internationally

We should keep supporting our members working abroad. Two years ago, in-person conferences and meetings began to happen again and the CAS has ambassadors like Ron Kozlowski, FCAS, who help build connections between CAS leadership and members, employers, candidates, and universities in their region. This gives us valuable perspective in understanding how the CAS can continue to be the only global actuarial organization focused on P&C work. We should also continue our work with international actuarial organizations, building on several years of bilateral leadership meetings across our target markets, including most recently at the International Actuarial Association Council and Committee Meetings in Seoul.

Expressing thanks to the CAS volunteer and staff

The strength of the CAS is our community, which is built on volunteers, staff, members, candidates, students, and Affiliates. I have loved seeing this community at our large meetings, our Regional Affiliate meetings, and at our Student Central Summer Program. There are a lot of people working to help make the CAS what it is and for that we should be grateful. If you are considering volunteering, please take the VIP survey.

Finally, I hope the rest of the summer is a great time for all of you and wish you a successful second half of 2024. ●

See real-time news on our social media channels. Follow us on Facebook, Instagram and LinkedIn.

Empowering Actuarial Excellence: Lend Your Voice to the CAS Actuarial Professional Analysis to Shape the Future

The CAS is launching an ambitious new project that will shape the future of actuarial expertise: the Actuarial Professional Analysis (APA), a comprehensive evaluation that will allow the CAS to validate or redefine the content areas of greatest importance to current and future actuaries.

All CAS members and candidates will have an opportunity to provide input to the evaluation, with the results used to determine the appropriate weights and cognitive levels of various content areas within the CAS credentialing curriculum. This will enable the CAS to validate existing coverage of content or redefine how various topic areas should be assessed. While the evaluation is customized for the property-casualty actuarial profession, the concept of the analysis is typical of periodic industry-wide evaluations seen in other professions requiring certification.

"The evaluation will inform redesign efforts that are absolutely crucial for maintaining our ACAS and FCAS credentials' value and relevancy, both in the current business environment and in the future," said CAS President Frank Chang. "It's important to have broad input from across the property-casualty actuarial profession, in order to ensure the results of the APA reflect the current and future skill-building needs

of actuaries and those who rely on our expertise. I encourage all members to take advantage of the opportunities to make your voice heard throughout this process," he added.

The primary means of gathering stakeholder input will be a survey of CAS members and candidates, which is expected to open in late 2024. Input will also be gathered in a variety of other ways, such as one-on-one interviews, roundtable discussions, listening sessions and focus groups. The development and execution of the APA is being managed by a task force of staff and volunteers and supported by a subcommittee of the CAS Board.

"The CAS credentialing requirements are designed by actuaries, for actuaries," commented William Wilder, CAS VP-Admissions. "There's no better chance to help influence our curriculum beyond serving on an exam committee than by participating in the APA."

Visit casact.org/APA or contact apa@casact.org if you have any questions or comments about the APA. ●

IN MEMORIAM

Nolan Asch (FCAS 1979)
1949-2024

Jeffrey T. Lange (FCAS 1964)
1940-2024

COMINGS AND GOINGS

Derek Pouliot, FCAS, CPCU, FCIA, was appointed chief reserving officer of Ryan Specialty Underwriting Managers (RSUM) at Ryan Specialty. In his expanded role, Pouliot is responsible for valuation of underwriting results for all business written by RSUM, including portfolio analysis, risk modeling, early warning detection, and analytical claims data production and insights.

Martina Jackson, ACAS, was appointed as underwriting and actuarial analyst at Blue Ocean Reinsurance Group. Jackson has a well-established reputation for her expertise and service across the Cayman Islands and Caribbean region. She has specialized in valuations of property-casualty reinsurance transactions and boasts a robust career history with Big 4 audit firms.

Jean-François Tremblay, FCAS, was appointed head of the property-casualty practice within Canada for the Insurance Consulting and Technology division at WTW. Tremblay has extensive experience in various technical, operational and strategic capacities, including pricing, product management, underwriting and risk management with top Canadian carriers. He has 25 years of expertise in the Canadian market.

Joseph A. Milicia, FCAS, MAAA, was appointed chief actuary at QBE North America in May. He previously served as the company's chief reserving officer. Milicia currently serves as a member of the CAS Board of Directors. ●

EMAIL "COMINGS AND GOINGS" ITEMS TO AR@CASACT.ORG.

Transform Math Education.
Celebrate 30 Years of Unlocking Student Potential!

30 YEARS
The Actuarial FOUNDATION

For three decades, we have dedicated ourselves to transforming the landscape of math education in the United States, providing free resources to empower young minds. Our focus is on igniting the passion for mathematics and fostering the next generation of problem solvers, innovators, and leaders. Over the years, we have impacted countless lives, and now it's time to commemorate our journey in a grand way.

Ways to Celebrate

01 *Mission Math Podcast:*
To expand awareness of the Foundation's crucial work and celebrate 30 years of success, we will create four podcasts during 2024. Our guests will include key stakeholders within the actuarial community, including dedicated volunteers and TAF program participants.

02 *Fundraise a Mathapalooza Event:*
Besides celebrating 30 years of math milestones, we need your help preparing for the next 30. We are looking for volunteers to host fun FUNDraising and/or FRIENDraising events at their place of work, actuarial club meetings, or other venues. A TAF-themed birthday party? Pub Trivia? Talent show? The possibilities and potential for fun are endless!

03 *Community Spotlight Blogs:*
The Foundation would not be where it is today without our donors and supporters. We are grateful for the time and effort our volunteers, donors, and supporters put in to make our mission possible. Read about the stars in our community in the Foundation blog and learn how you can help!

To learn more visit:
actuarialfoundation.org/30th-anniversary

IN REMEMBRANCE

In Remembrance is an occasional column featuring short obituaries of CAS members who have recently passed away. These obituaries and sometimes longer versions are posted on the CAS website; search for "Obituaries."

The Crafter/Gamer
Aaron Mark Sass (FCAS 2021)
1994-2023

Aaron Sass died in August 2023. He is survived by his parents, Bruce and Ellen Sass; brothers Brian (Kris) Sass-Hurst and Matthew (Katie) Sass; nephews Ezra and Charlie; grandfather, Homer Sass; and many extended family members. Born and raised in Columbus, Ohio, Sass attended Worthington City Schools and The Ohio State University. Sass excelled academically and athletically. He was a pole vaulter for the Worthington Kilbourne High School track and field team and played soccer and football. Sass easily met and made many meaningful friendships that lasted into adulthood. He and his friends loved playing video games together on weekends to unwind. He used his sharp intelligence to routinely hone his chess skills. His longtime partner, Molly Berlin, and he had a great love for their dog, Philbert. Sass enjoyed traveling, exploring and jokes. He took great pride in perfecting his crafts of cooking, baking and coffee brewing. With family, Sass always paid special attention to young cousins and nephews to keep them entertained. He was a loving brother and always willing to help when needed.

The Historian
Nolan Asch (FCAS 1979)
1950-2024

Nolan E. Asch of New York, New York, passed away in May 2024. Asch attended school at New York's Columbia University and New Orlean's Tulane University. He worked for SCOR Re and ISO (now Verisk). A longtime volunteer for the CAS, Asch was a CAS Student Central Liaison and a member of the Prizes and a member of several committees, including Awards Administration, Strategic Planning, Ratemaking Seminar, Long Range Planning, and the Syllabus and Examination. Asch enjoyed history and was a member of the Summit Old Guard, American Revolution Round Table, Civil War Round Table and the Alexander Hamilton Awareness (AHA) Society. He also helped raise awareness on the importance of monitoring near Earth objects like asteroids in the late 1990s. He is survived by his wife, Mary Ellen; children, Melissa (Robert) McInerney and Greg Asch; sister, Elizabeth Downing; two grandsons; and two nephews.

A CAS Past President
George Morison (FCAS 1962)
1928-2021

George Morison, CAS President from 1976-1977, died in June 2021 in West Hartford, Connecticut. He was 92. Born in Freeport, New York, he graduated from Fordham University in New York. He married Patricia Graf in 1954, and they had three children, six grandchildren and two great-granddaughters. Morison enjoyed a lengthy career in the insurance industry as a casualty actuary and had many ideas for the CAS that are in place today. Just a few years after getting his FCAS, he authored the paper "Study of Expenses by Size of Risk," which was published in the 1965 *Proceedings of the Casualty Actuarial Society*. A little more than 10 years later, Morison would become CAS president. In his presidential address in November 1977, Morison presaged the development of the P&C actuarial pipeline with university and high school student outreach programs, the importance of feedback from new CAS members for long-range organization planning and the involvement of more members in volunteer opportunities. George and Pat Morison were longtime West Hartford residents and founding members of the Church of St. Peter Claver there. After his wife died in 1994, Morison remained a devoted community member in West Hartford and at The McAuley. He is survived by his brother Robert; children, Timothy, Maureen and Paul; his grandchildren; and great-granddaughters. ●

CAS STAFF SPOTLIGHT

Meet Josie Harler, Professional Education Manager

Welcome to the CAS Staff Spotlight, a column featuring members of the CAS staff. For this spotlight, we are proud to introduce you to Josie Harler.

- **What do you do at the CAS? How does your role support the strategic plan/envisioned future?**
  As professional education manager, I help CAS members build skills for the future through continuing education offerings such as webinars and content at the Seminar on Reinsurance. As a staff chair for the Reinsurance Seminar and Webinars Working Groups, I work closely with our volunteers to ensure we are offering a variety of topics in our sessions and use feedback from attendees to aid in planning our future offerings.

- **What inspires you in your job? What do you most love about your job?**
  I love engaging with our volunteers! Volunteers at the CAS are passionate about what they do, and I greatly enjoy working with them to provide quality content for our members.

- **Describe your educational and professional background. What do you bring to the organization?**
  I have a master's degree in education and a background working in various roles with students and educators in the K-12 landscape. Most recently I worked in a mental health program helping teens reach their academic goals. In my roles, I have worked with diverse individuals and am practiced at listening empathetically in order to adapt content and create objectives that meet a variety of needs. I have found that my time concurrently managing student learning with a wide range of abilities, as well as analyzing multiple types of data to inform instruction, have been immediately applicable to my work here at the CAS. I am a curious individual, and I am excited to continue to learn about actuaries and their profession as I work in adult education and focus on providing the best learning experience for our members. I was excited to take my experience and apply it to adult education.

- **What is your favorite hobby outside of work?**
  I am a video game nut (a true Mario Kart master), and I love spending time going on walks with friends and family. The way I grew up, sometimes the best way to get some alone time was to travel to the shore and spend a couple of hours wandering through the streets of a new city or along forest paths. I continue this habit today and love walking through small towns where I live or somewhere out in nature.

- **If you could visit any place in the world, where would you go and why?**

Josie Harler

New Zealand! The country has beautiful landscapes that I would be ecstatic to see in person.

- **What would your colleagues find surprising about you?**
  I lived on a sailboat with my family from the ages of 12-18. We spent about four years in the Caribbean traveling as far down as Trinidad and Tobago. When I was 16, we crossed the Atlantic, spent some time in Portugal and ventured into the Mediterranean.

- **How would your friends and family describe you?**
  A lover of puns who is excited by the little things in life. I often get excited by cool new tech features, the creativity of others, new candles, new foods, new experiences, interactive exhibits at museums, etc. One of my personal favorite puns: How do you organize a space party? You planet! ●

CAS SPOTLIGHT ON DIVERSITY 2023
WOMEN IN THE CAS

United States Membership and Candidate Data as of December 2023

The CAS is sharing demographic data of members and candidates to be transparent about our diversity efforts and to hold ourselves accountable.

CAS Community Today

- **31%** All CAS Members
- **34%** New Members 2014-2023
- **34%** ACAS Exam Candidates 2023
- **35%** MAS-I Exam Candidates 2023
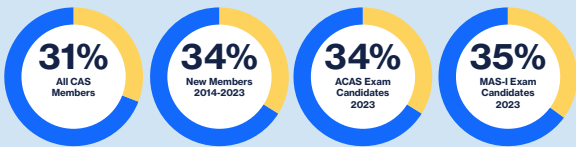
98% of US members and 94% of US ACAS candidates in 2023 voluntarily reported their gender.
The CAS recognizes other gender identities besides male and female.

Comparison to External Benchmarks
Women make up 51% of the US population ages 25 & Up

- **59%** Insurance Industry Employees
- **47%** Mathematics Employees
- **38%** STEM Bachelors Degrees
- **47%** Business Bachelors Degrees
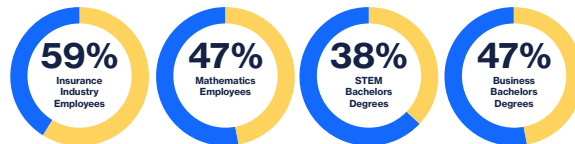
US population, Ages 25 and up, estimated for 2022 by US Census Bureau, Population Division.
Insurance Industry Employees in 2022 based on Bureau of Labor Statistics Current Population Survey.
Mathematics Employees from 2017-2019 based on Pew Research Center analysis of American Community Survey.
Science, Technology, Engineering and Math (STEM) and Business Bachelors Degree Conferred
in 2020-2021 based on National Center for Education Statistics Digest of Education Statistics.

Gender Breakdown of Worldwide CAS Members by Race/Ethnicity

Female | Male

- All Races/Ethnicities: **31%**
- White: **30%**
- Asian: **45%**
- Latino: **26%**
- Black: **34%**
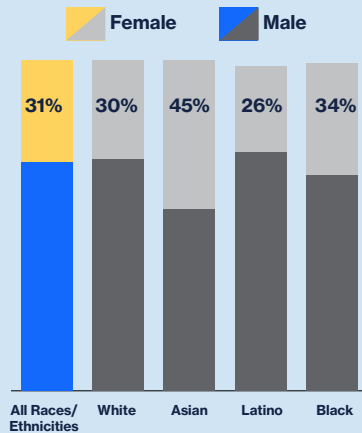
Percent of Worldwide Female CAS Members in Leadership Roles

- **33%** Volunteers in the latest year compared to 34% in 2022
- **32%** Conference Presenters in 2021-2023, compared to 32% in 2020-2022
- **26%** Committee Chairs in 2021-2023, compared to 26% in 2020-2022
- **47%** Executive Council/Board in 2019-2023, compared to 49% in 2018-2022

GET INVOLVED

NAWA — Network of Actuarial Women and Allies

CAS

SUPPORT THE NETWORK OF ACTUARIAL WOMEN AND ALLIES AT NAWAACTUARIES.ORG

JOIN THE DIVERSITY IMPACT GROUP TO VOLUNTEER AND SHARE YOUR IDEAS AT COMMUNITY.CASACT.ORG

If you want to make sure that your demographic information is included in these metrics, please log on to the CAS website and update your membership profile.

MAKING THINGS HAPPEN

The Magic Behind Monographs By DR. SARAH SAPP, CAS EDITORIAL/PRODUCTION MANAGER

The "Making Things Happen" column features CAS and iCAS members who serve the associations in many capacities and enrich the volunteer experience for all.

CAS Monographs delve deep into specific topics relevant to P&C actuaries, providing in-depth analyses and insights not found in other industry publications. They cover a wide range of subjects such as risk modeling, reserving methods, pricing techniques and emerging trends in insurance. Monograph content undergoes rigorous peer review, ensuring that each contribution meets high academic and professional standards. Actuaries can trust the accuracy and reliability of the information presented, making it a valuable resource for their work. Many shape exam test questions for years to come.

Monographs often include practical case studies, examples, and real-world

applications of actuarial concepts. This helps actuaries understand how theoretical principles translate into actionable insights for insurance companies, regulators and other stakeholders.

While it is easy to attribute the excellence of the literature to incredible authors, Monographs would not be possible without the help of the Monograph Editorial Board (MEB), led by Brandon Smith, FCAS, MEB chair.

"I believe the Monographs are some of the very best resources we have in actuarial literature for authoritative and comprehensive coverage of technical topics for practitioners," said Smith. "My goal is to maintain their quality and relevance."

As MEB chair, Smith leads the group's monthly meetings. "However, as we are a [board], decisions are not made unilaterally, so I wouldn't say my responsibilities are too different from other members," said Smith.

The key volunteer role within the MEB is being a monograph "shepherd." For each monograph, the working group assigns a liaison who stays in touch with authors and keeps the MEB informed of progress.

"This person has the opportunity to steer and shape a monograph and work with the authors to ensure we stick to our rough deadline," said Smith. "Of course, we are all volunteers, both authors and MEB members, so timelines tend to be guides. The liaison member aims to keep the momentum going."

"We have a pretty large pipeline of

Brandon Smith

monographs at the moment, including ones on penalized regression, mixed models, machine learning and capital modeling. All are at various stages of development, and I look forward to seeing them all come to fruition."

Smith's proudest accomplishments are the monographs that make it onto the CAS syllabus. "These texts are widely read and studied and convey the knowledge required to become a credentialed P&C actuary," said Smith. "I hope to see more future monographs added to the CAS syllabus."

Smith graduated from Fordham University with degrees in mathematics and economics before earning his FCAS and will soon be completing a master's in analytics.

"Volunteering allows me to interact with leading actuaries across diverse backgrounds, specializations and skills. It is a way of engaging with the wider community beyond your coworkers that I highly recommend." ●

CAS MONOGRAPH SERIES
NUMBER 12

THE ACTUARY AND ENTERPRISE RISK MANAGEMENT: INTEGRATING RESERVE VARIABILITY
Mark R. Shapland, FCAS, FSA, MAAA
Jeffrey A. Courchene, FCAS, MAAA

CASUALTY ACTUARIAL SOCIETY

CAS
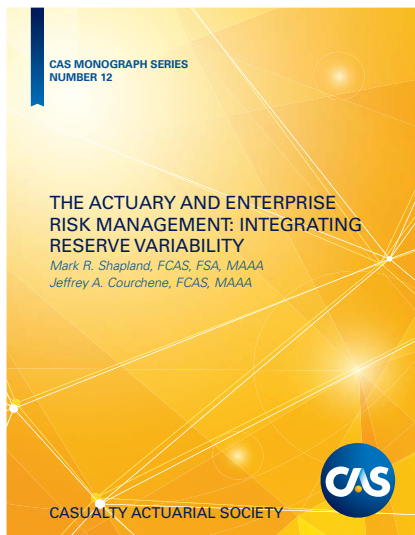
Access More Qualified Applicants. Period.

Expertise. Insight. Solutions.®

The CAS Career Center allows employers and recruiting firms to post open positions to a focused audience of credentialed P&C actuaries, actuarial candidates, and interns.

Posted positions average nearly 1,000 hits each.

Learn more at https://careers.casact.org/employers/

NEW FELLOWS ADMITTED OR RECOGNIZED IN MAY 2024

Row 1, left to right: *Runjie Zhu, Tingting Shi, Gregory Breda, Nicole Irene Curran,* **CAS President Frank Chang,** *Janeth Fernandez Ramos, Arya Mehta, Yun Ling, Marie-Alexie Turcotte.*
Row 2, left to right: *Michael David Leonard, Nicholas Araujo, Lester Lim, Ru Wang, James Henry, Dehua Hang, Zhe Han.*
Row 3, left to right: *Michael James Seeber, Felix Martineau, Armin Yousefi, Jake Ruben Levinson, Kethan Reddy, Robert McCann, Jean-Philippe Chagnon, Nicholas Ryan Pilsner.*

Row 1, left to right: *Timothy Daniel Murray, Fengzhu Zhang, Huiying Kang, Louisa M. Diggins,* **CAS President Frank Chang,** *Gabrielle Dube, Travis Blake Lawrence, Justine Power, Jack Tu.*
Row 2, left to right: *Rebecca F. Roberts, Taylor Richard Van Laar, Matthew Robert McDermott, Vijay Persaud, Yanjun Shen, Robert Noehammer, Shan Lu.*
Row 3, left to right: *Brian Andersen, Dennis James Dionne, Chandler Fischbeck, David Matthew Fernandez, Matthew Colagreco, Justin Cicchini, Dan Yeung.*

Row 1, left to right: *Thomas Stava, Min Gu Lee, Nikolas Dreyer,* **CAS President Frank Chang,** *Jovana Thy Nguyen, Julie Tse, Michael Thomas Cathcart.*
Row 2, left to right: *Ronni Luftig, Patricia E. Smith, David Jacobson, Gregory Ryan Stambaugh, Mark Khaimov, Andrew Hancock, Unidentified Fellow.*

Left to right: *Dongdong Liu and* **CAS President Frank Chang.**

Left to right: *Yujie Yan and* **CAS President Frank Chang.**

New Fellows not shown: *Peter Abbate, Clinton Bartlett, Kevin D. Bell, Martin Boisvert, Aiden Busby-Mott, Christopher Butz, Katherine Cahoon, Gary James Cummings, Zhiyao Dai, Francois Dery, Katelynn Doherty, Robin Driscoll, Simon Geist, Eric Alan Gerwin, Keven He, Xinyi He, Chad Alan Henemyer, Hsin Haw Hsu, Gloria Zhongmin Hu, Cheryl Ip, Cody Jacobson, Jacob Joseph Jakubowicz, Lisa Jaskowiak, Yongxin Jin, Phillip Daniel Kall, Ryan Kehlet, Min Yue Kong, Christopher J. Lambert, Antoine Langevin, Edward Wai Hin Lee, David Lembke, Evelyn Monica Leonardi, Jinyuan Li, Xiong Lian, Willis Liu, Yi-Ching Liu, Kayley Loo, Lisa Marie Lozen, Karen Lu, Justo Steven Maldonado, Fabrice Malo, Karl Hans Meissner-Roloff, Madelynne Hunter DeLoach Miller, Matthew D. Moore, Aisha Nuval Binti Othman, Stephen Andrew Palkert, Kevin L. Pascal, Alexander Phung, Emily Jeffrey Point, Yik Shen Pui, Hao Qin, Matthew Varughese Samuel, Garen Sargsyan, Cassandra Kay Shreves, Tristan Shute, Josephine Sommer, Tianyi Song, Tara Sooreechine, Andrew Stomper, Sabrina Tan, Ryon M. Tartell, Simon Tremblay, Ming-Yen Tsai, Xin Ming Wan, Xumeng Wang, Ryan James Whiting, Leah Ann Windt, Choon Hoong Wong, Frederick Wallace Wright, Di Wu, Morgan Xiong, Xi Yin, Thomas Zdarsky, YiFan Zhou.*

NEW ASSOCIATES ADMITTED OR RECOGNIZED IN MAY 2024

Row 1, left to right: *Willies Ojiambo Mboko, Andrew Smeed, Jason Wang, Unidentified Associate,* **CAS President Frank Chang,** *Jennifer Fells, Danielle Alyse Guenther, Stasya Houghton, Emma Taylor.*
Row 2, left to right: *Jorie Steinberg, Ryan Clorfeine, Julia Curry, Steven Edward Rosso, Cori Rochelle Garrett Kreif, Hannah Fox Kaufmann, Shannon Osterfeld, Joshua Abrams.*
Row 3, left to right: *Michael Andrew Kossuth, Grant Robert Brooks, Vincent William Porcelli, Joseph Moynihan, Alex Frister, Claire Marie DiOrio, Matthew Paul Schira, Kristaq Kresto.*

Row 1, left to right: *Lucy Chen, Kayla M Gephart, Brittany Strausser, Elizabeth Steele,* **CAS President Frank Chang,** *Julia Catherine Averna, Shuting Yu, Kristan H. McGraw, Angela Fang.*
Row 2, left to right: *Robert Moser, Robert Timothy Wondolowski, Ziyan Li, Quang Thien Le, Andrew Kump, Carlos Felippe Rostand Koetz, Megan Benoit.*
Row 3, left to right: *Robert Allen, Jeremy Borger, Jamir Williams, Jacob Liggett, Alec Ward, Eric Bayer, Gavin Roswarski, Mitchell Lindsay.*

Row 1, left to right: *Han-I Huang, Yiyin Pang, Kwabena Boateng, Phoebe Man Kiu Choi,* **CAS President Frank Chang,** *Joycelyn Aryeetey, Michael Forth, Jun Li, Nigel Cheung.*
Row 2, left to right: *Sarah Spaeth, Sanchi Jalan, Emmanuel Nketia Boateng, Bastien Antaki, Julianne Ferreira, Helen Zhi, Gloria Hong.*
Row 3, left to right: *Jordan Gels, Logan Genteman, Reiner Atstathi, Kimberly Fabanich, Jean-Pascal Dagneau, Joshua Friend, Michael Jeffers, Alexander Sowa.*

Row 1, left to right: *Trisha Chan, Nicole Cristina Grazda, Sonu K. Sarraf, Franz Peter Schauer,* **CAS President Frank Chang,** *Katie Mason, Bryanna Lum, Misbah Zuberi, Ashley Laverne Neuenfeldt.*
Row 2, left to right: *Jason A. Mehalic, David Lawrence McMillan, Amelia Carroll, Chase Conover, Sik Yu Lau, Huaming Yan, Matthew Omillian.*
Row 3, left to right: *Zachary Scott Phillips, Mario Cannamela, Kevin Trehy, Marc Stephane Gagnon, Brandon Kleinmann, Cory Smith, Parker A. Grant, Kevin Kiehne.*

NEW ASSOCIATES ADMITTED OR RECOGNIZED IN MAY 2024

Row 1, left to right: *Meenu Arora, Miles Price Cushing, Lian King, Audrey Roy-Doyon,* **CAS President Frank Chang,** *Christophe Royer, Jacob Pawlowski, Drake William Weisman, Alexandre Gagnon.*
Row 2, left to right: *Michael Robert Etkin, Daniel Suryakusuma, Kinsey Kiffmeyer Turk, Hailey Lynn Walters, Eliot Collins, Leo William Austin, Willam Perron-Lafleur, Caroline Palen.*
Row 3, left to right: *Ron Punnoose, Yinran Huang, Francisco Mojica III, Joseph Mario DiFabrizio, Gerald Samuel William Olson, Jarrod Mikolajczyk, Daniel Harris, Benjamin Taylor Caldwell, Hayden Graham.*
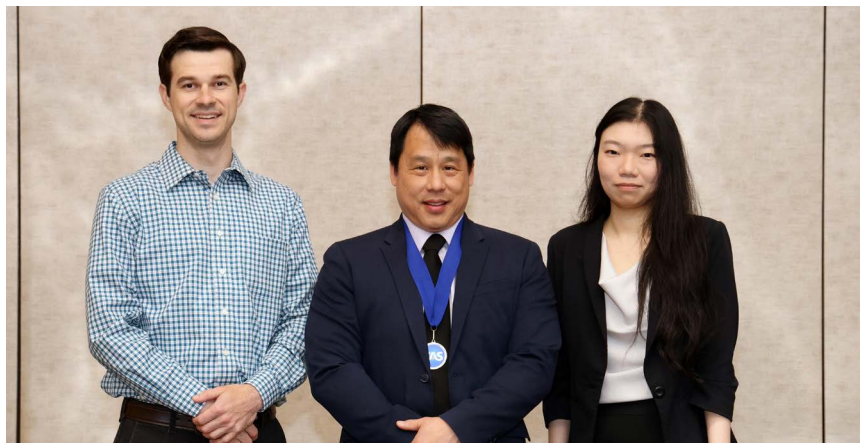
Clem Bolton Holding Boney, **CAS President Frank Chang,** *Yanshu Guo.*

*Yiqi Zhao and **CAS President Frank Chang**.*

New Associates not shown: *Benjamin Albright, Michael Aloisio, Eric Amstislavskiy, Jack Anderson, Laura Aswani, Helen Murphy Babb, Patrick Baker, Maathuresh Baskaran, Puneet Singh Bassi, Alexander Basyrov, Mallory Beard, Christopher Bellwood, Jacob Owen Bergin, Jocelyn Bernstein, Amanda Bezugly, Crystal Lily Boch, Liam Carleton, Shekina Carpanen, Ryan Michael Causey, Wai Yan Chan, Jialu Chen, Yiwen Chen, Sihan Cheng, Weiyang Cheng, Hannah Cifaldi, Shannon Cikowski, Vicky Coté, Jingyi Cui, Mikayla Daniels, David Michael Dardano, Robin James P. Dasmarinas, Marco Del Papa, Jonathan Diaz, Michael R. Dickey, Monica Nicole Diller, Chenyue Ding, Haokuan Dong, Ryan Dowdle, Daniel Jacob Drabik, Jalen Dressler, Owen Ellis, Joseph Fairweather, Jonathan Fee, Robert Findlan, Binata Fleysher, Jacob R. Flisakowski, Adam French, Alec Gagnon, Kyle Stephen Gallagher, Meyer Gilden, Jake Gnieser, Samantha Gong, Matthew Gotkin, Akshay Goyal, Tiffany Barbara Graff, Luke R. Guatelli, Francis Guerin, Tierney Gustafson, Othon Patrick Hamill, Garam Han, Martin Seung Ho Han, Kateri Hawley, Yunan He, Matthew Lee Hebert, Joshua Manuel Herrera, Siu Kei Johnny Ho, Joseph Michael Hoffman, Lu Huang, Cheryl Immanuela, David Iruegas, Walker Jinks, Veronique Jobin, Delaney Elizabeth Johnson, Ibraheem Owolabi Kadiku, Kurt Jeffrey Kaskey, Eddy Kim, Stephen Kim, Holly L. King, Justin K. Knowles, Nicole Knudsen, Jack Krupinski, Jessica Kurlander, Sippawich Laosirichon, Albert Lee, I-Der Lee, Qiang Lei, Olivia Ann Lemieux, Lauren Lenz, David Elias Levinson, Leyang Li, Yang Li, Guanghao Liang, Birong Lin, Allison Liu, Yucong Liu, Jacob Michael Logan, Sarah Luevano-Woods, Kenneth Luo, Xiao Luo, Niko Macaluso, Kevin Macias, Zeenia H. Madan, Thao Mai, William Markowitz, Alyson Marquis, Kaitlin Christine Marra, Sarah McCracken, Jason McDowell, Drew Catharine McKinlay, Matthew Melnychuk, Samantha Meneilly, Thomas James Mengwasser, Joseph M. Morris, Elizabeth Jane Murray, Wei Qi Ng, Na Ni, Tyler Robert Palsgrove, Yijia Pan, Joshua Peterson, Gerald Jacob Pfeil, Adam Poertner, Matthew B. Prelaz, Myles Prior, Zhengliang Qian, Jamie Rees, Jaylen Reichner, Brandon L. Rigdon, Kyle Rittmueller, Sydney Ro, Ian Rycroft, Christy Sabu Zacharia, Stuart Salton, Leon Santhakumar, Maria Katrina Isabella Santiano, Saurabh Santoshkumar, Luke Senft, Malika Shah, Nishi Shah, Tadir Felix Shapir, Stephen James Shelly, Richard Shi, Adam Somers, Danielle R. Sorenson, Caitlin Sparks, Shea Chaffee Speicher, Mason C Spitz, Jonathan Squibb, Scott Aaron St. Onge, Zachary Koh Stekler, Bjorn John Stolhammer, Nirbhay Sutaria, Shuo Tao, Daniel Taen Teng, Annie Kate Thornton, Chelsea Tran, Tina Tsai, Evgeniy Vilinetsky, Jing Wang, Wenda Wang, Ying Zhe Wang, Mitchell Aaron Wasowski, Joshua P Weaver, Mateusz Weglicki, Shuyi Wei, Stanton A. West, James Lowell Whittier, Sanford Wilson, Jacqueline T. Wu, Jiaying Wu, Bingfeng Xie, Hong Suk Yang, Zihong Yang, Stephen Yao, Stephen Yeh, Weitao You, Xiaotong Yuan, Liana Zatuchny, Anlan Zhang, Chujun Zhang, Min Zhang, Ruijia Zhang, Wenjing Zhang, Bin Zhao, Zaikeng Zhong, Huichao Zhu, Noah Zimmerman, Ryan Ziobro.*

Scenes from the CAS 2024 Spring Meeting

1. CAS Board Director Steve Belden (left) celebrates with new Associates Joycelyn Aryeetey, Emmanuel Boateng and Kwabena Boateng.
2. Seasoned Actuaries meet New Associates at their Spring Meeting Monday night dinners. Seated (left to right) are CAS Fellows Jim MacGinnitie, Mike Toothman, Gail Tverberg, Barry Zurbuchen, Dale Porfilio, Pat Teufel, Dave Hartman and John Gleba. Standing new Associates (left to right) are Nicole Grazda, Parker Grant, Franz Schauer, Brittany Strausser, Michael Kossuth, Reiner Atstathi, Willies Mboko, Trisha Chan, Kayla Gephart, Vincent Porcelli, Shannon Osterfeld and Marc Gagnon.
3. Pleased with their CAS pins are (left to right) CAS Board Director Len Llaguno, FCAS; Spring Meeting Working Group Chair Meagan Mirkovich, FCAS; and CAS Board Director Sandy Lowe, FCAS.
4. New Associates arrive early for the Celebration of New Members. Pictured left to right are Bryanna Lum, Michael Robert Etkin, Jorie Steinberg, Stasya Houghton and Kimberly Fabanich.
5. New Fellow Taylor Van Laar (center) waits with his parents Kris and Kenneth Van Laar Jr., FCAS, for the Celebration of New Members to begin. Van Laar is an assistant actuary for Allstate Insurance Company in Martinez, California. The elder Van Laar is chief risk officer for State Compensation Insurance Fund in San Francisco.
6. Spring Meeting Featured Speaker Chaunté Lowe (right) and Jacob Galecki of Galecki Search Associates, LLC, who introduced Lowe. A world-class athlete, Olympian and cancer survivor, Lowe presented on the "Champion Mindset: Overcoming Adversity and Tenacity During Challenging Times."
7. Family and friends celebrate during the reception for new Associates. Some of those celebrating includes Mario Cannamela, ACAS, and his guest Courtney Collings; Jason Wang, ACAS, (left) and his wife, Chenxi Li; Daniel Suryakusuma, ACAS, (right) and his fiancé Betty Hwang; Joseph DiFabrizio, ACAS, (left) and his husband Dalton Connolly; and Danielle Alyse Guenter, ACAS, (right) with her husband Marius.
8. The CAS held a Townhall on May 6 to answer members questions from the in-person and virtual audience. Pictured left to right is CAS CEO Victor Carter-Bey, Board Chair Roosevelt Mosley Jr., President-Elect Dave Cummings and President Frank Chang.

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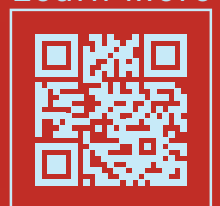
2024
CAS ELECTION

C AS voting members (all Fellows, plus Associates who have been members for at least five years) will have the opportunity to vote on a slate of candidates for the CAS Board of Directors and CAS President-Elect, with online voting beginning on August 1, 2024. On that day, voting members will receive an email with a link to the online ballot. Completed ballots must be submitted online by August 30, 2024.

In the following pages, readers can learn about the candidates through the 100-word summaries they provided regarding their interest in running for CAS leadership positions.

More details about each candidate can be found in the Meet the Candidates section of the CAS website. Please contact Mike Boa (mboa@casact.org) with any questions or comments about the election process. ●

Meet the *Candidates*

President-Elect Nominee

Barry Franklin
FCAS 1993

My actuarial career spans pricing, reserving, risk management and risk modeling and includes experience within insurance companies, consulting firms, audit firms and insurance brokers. I have seen the value actuaries bring from just about every conceivable perspective and am definitely bullish on the future of the casualty actuary in the world of risk management and insurance. I believe the future of the CAS actuary lies somewhere in the intersection of enterprise risk management and data science, which implicitly includes traditional insurance company roles but provides opportunities far beyond. The CAS is well positioned to support its members in this endeavor.

Board Director Nominees

Raju Bohra
FCAS 2022

I am honored to be considered for the CAS Board of Directors. My goals as a CAS Board member include professional training and development, collaboration with industry groups and expansion globally. These goals would be supported by attracting a diverse set of future actuaries, informing society on the benefits and risks of predictive models and AI, and advocating for the effective use of insurance to support social and economic stability, resilience and fairness. As the CAS has supported my career, I would be committed to promoting excellence, innovation, collaboration and inclusivity within our profession to meet our potential.

David Foley
FCAS 1992

It is an honor to be nominated to represent the membership on the CAS Board. Currently I serve on the board of a regional insurance company where I serve as chair of the audit committee. This allows me the time to fully commit to the CAS: increasing membership engagement, enhancing innovation and education to build our skills for the future and grow our membership, including DEI, while maintaining the integrity of our credentialing process. General insurance actuaries are extremely important to global economic markets through our highly skilled and valued role in the insurance industry. We are the greatest profession!

Richard Gibson
FCAS 1990

My career as an actuary has spanned over 40 years, during which I have worked in various roles. My work has included technical, managerial and leadership positions. The majority of my time has been spent working with P&C insurance companies, but I have also worked as a consultant. During the last five years, I have served as the Senior Casualty Fellow for the American Academy of Actuaries. In this assignment, I have had the opportunity to be involved in public policy issues that are important to actuaries. It would be a privilege to serve on the CAS Board.

2024 CAS Elections

Yi Jing
FCAS 2005
What I have achieved came from the opportunities the actuarial profession has provided me. Serving on the CAS Board allows me to continue to make a contribution to an organization that makes a difference in our life. I believe I am equipped to serve on the CAS Board with the strong project management and leadership skills and deep knowledge about the insurance industry I have built over the past 20+ years. I believe this will enable me to work collaboratively with others on the board to help the CAS navigate the industry challenges we are facing.

Anand Khare
FCAS 2013
I have a history of service to the CAS, including co-authorship of the GLM Monograph on Exam 8, and hope to continue that service on our board. I'm running in part because I believe that the lower-level work we do, like picking development factors off of triangles, will eventually be disrupted by automation. To guard against this, and to develop new opportunities for our members, we'll need to move the profession further up the value chain. The CAS will need to play an active role. I'm confident that I can work with our board to make this happen.

Jason Machtinger
FCAS 2003
It is an honor to run for a seat on the CAS Board. I believe that it is important for international CAS members to have a voice on the board when setting direction, to ensure that actuaries across the globe have access to the top-notch education that the CAS can provide; U.S. members have exposure to, and recognition by, other actuarial societies; CAS admission requirements remain at the leading edge globally; and CAS members have top qualifications to compete for international career opportunities. I will also strive to increase the presence of CAS actuaries in nontraditional roles.

Simone Walker
FCAS 2023
With 20 years of experience in the actuarial field, I have benefitted greatly from the professional, educational and social opportunities provided by the CAS and actuarial community. My leadership roles with SAGAA and IABA reflect my dedication to increasing diversity and fostering inclusivity within the profession. I have led actuarial teams, collaborated with business partners and developed inclusive communications for CAS members. My broad P&C experience and proven leadership skills uniquely qualify me to

drive positive change, helping actuaries become key influencers and future C-suite leaders. I appreciate your support and vote.

Charles Zhu
FCAS 2021
I am excited to represent the future of the actuarial profession as a recently credentialed Fellow, and my past volunteering activities are a testament to my determination to expand the CAS's influence and create a diverse community of P&C actuaries. I have volunteered to empower the actuarial community and the CAS in several capacities, including as the chair of the CAS Case Competition Task Force and as a board member of Abacus Actuaries. I am committed to ensuring the CAS stays relevant by meeting emerging technological needs while offering the proper educational resources to build business acumen and soft skills.

The Next Wave of ILS: Casualty

By JESSICA SCHULER

asualty insurance-linked securities (ILS) is a rapidly growing field offering a fascinating glimpse into the future of insurance risk financing.

ILS landscape

Originating in the 1990s, ILS is a risk financing innovation that created additional capacity for property catastrophe (CAT) risk when reinsurers were unwilling or unable to offer coverage. ILS allows institutional investors to gain exposure to particular types of insurance risk with well-understood characteristics that make them an attractive diversifier in a larger investment portfolio. In the absence of ILS, investors seeking insurance exposure would only be able to invest in an insurance company stock, which exposes the investor to market beta along with all the idiosyncratic risks that might impact the returns of a larger insurance organization. Only insurance-linked securities offer isolated exposure to zero-beta insurance risk.

Historically, while most ILS investors have been focused on property CAT risk, many are now turning their attention to casualty — in particular, non-CAT casualty risk. Casualty ILS are a diversifying asset that generates uncorrelated and low volatility returns with little risk of losing principle. In many ways, this is a more attractive risk than that of property CAT, which offers uncorrelated returns at the cost of higher volatility. As casualty business is longer-tailed than property business, premium and investor capital invested in casualty ILS can also earn investment income on float as claims arise over several years. The market for casualty risks, including both prospective casualty risk in the form of current-year premiums and retrospective casualty risk in the form of outstanding reserves, is on the order of hundreds of billions of dollars. So, the potential market for casualty ILS is significant.

Until recently, the majority of the market didn't think casualty ILS was possible. This was mostly because of the misconception that investors were afraid of longer-tailed risk and due to challenges in creating securitization structures that would work for both insurers and investors. These issues have been overcome, and institutional investors such as pension funds, sovereign wealth funds, private credit, hedge funds and life insurers have begun to invest in the market. As of the publication of this article, a handful of market players have transacted billions of gross casualty premium,[1] and exit paths have been proven through secondary transactions that provide liquidity to investors.

Use of casualty ILS

Many insurers and managing general agencies (MGAs) have attractive and diversified casualty insurance portfolios that ILS investors would gladly pay a fee to access. While many insurers today use ILS for risk management purposes — for example, for additional capacity on property CAT risk — more often than not, insurers are using casualty ILS as a capital management tool. At scale, this pattern of ILS usage has the potential to refinance the insurance industry. Insurers generally source capital via equity or debt. Securitization offers a third avenue to optimize capital that provides additional flexibility without diluting existing shareholders.

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[1] My company, Ledger Investing, Inc. ("Ledger"), has transacted nearly $2B of gross casualty premium as of April 2024.

Why would an insurer securitize their casualty portfolio?

- **Better management of underwriting cycles by sourcing flexible capital versus permanent capital (e.g., equity):** During a soft market, an insurer reduces deployed capital to write a business that provides adequate returns. In a hard market, an insurer might choose to source additional capital via securitization to write more business to capture increased returns. Capital flexibility provided by ILS provides a solution to the "curse of permanent capital" that often motivates insurers to write uneconomical business, exacerbating market cycles.
- **Source lower cost of capital:** ILS investors provide capital to finance insurance risk-taking, and this matchmaking directly with investors who are interested in insurance risk is more efficient than the traditional way an insurance company is financed. This allows insurers to free up capital for growth, fund acquisition costs, source capital in light of regulatory changes or rating agency requirements and assist in risk retention.
- **Increase shareholder value:** When an insurer securitizes a portfolio, it takes a portion of its casualty risk and turns it into a stable fee-income, reducing earnings volatility, boosting return on equity, and increasing shareholder value. The more profitable the business that's securitized, the more fee-income that's generated. Capital-light, fee-generating businesses are more valuable than capital-heavy businesses. For example, typical insurance brokers enjoy much higher multiples than typical insurance companies. The economics and valuation of a capital-light insurer operating in a post-securitization world might be closer to the economics of a broker or an MGA than to a traditional insurer operating today.
- **Low operational overhead:** The typical casualty ILS arrangement is structured as a simple quota share reinsurance agreement that aligns primarily on statutory product lines and receives full capital credit as a reinsurance transaction. Reporting overhead is substantially reduced relative to traditional reinsurance, which can be more complex in nature, and therefore, have higher operational overhead.

Value to the insurance industry

The cost of holding risk on-balance sheet is high. It is difficult to flex capital with swings in market pricing. Insurance is generally viewed as lagging other industries, given its capital intensity, and securitization offers a solution. Securitization also provides diversification of capital counterparties and capital certainty (cash or cash-like instruments available in a trust account with the cedent as the beneficiary).

It's hard to ignore the fact that there is potential to dramatically decrease the protection gap and foster innovation to partner with people and businesses to mitigate risk. Securitization facilitates access to global assets under management that far exceed capital allocated to the insurance industry today. With increased availability and efficiency of capital, securitization will increase the economic and societal impact of insurance.

Practical applications for actuaries

There are many actuaries today who support the placement of ILS transactions. This demand for actuarial support will continue to grow as the asset class expands. Investors are looking for:

- Consistency, objectivity and transparency from models that support transactions.
- Models that require little judgment from an analyst that can be easily backtested.
- Quick turnaround times and repeatable processes.

Ultimately, investors want standardization and transparency to make the asset class scalable. To model the risk, it's been necessary to produce stochastic projected cash flows to onboard investors. To this end, my company has created a fully Bayesian modeling framework, which is available in our website's library.

The return ILS investors see is a combination of underwriting profit and investment income, and so it's necessary to model the timing of premium, claim payments and changes in loss reserves. Many of the modeling problems my company thinks about every day are also faced by insurers, and we are committed to sharing our techniques and insights with the actuarial community to elevate the standards of the profession as a whole. As this asset class grows, investors will look to third parties to help them understand and price the risks they hold. This is an exciting time to be in ILS as an actuary. ●

Jessica Schuler, ACAS, is a director at Ledger Investing, Inc., a tech-enabled insurance securitization marketplace focused on casualty and non-cat property risk.

The Verdict on *Florida's* Tort Reforms

By JOHN DIVINE

Florida has a reputation as a difficult place for insurers to do business.
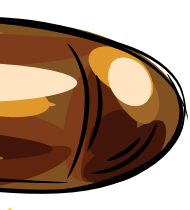
t doesn't help that the state is routinely pummeled by hurricanes and tropical storms, or that insurers tend to rely more heavily on pricey reinsurance, leaving them prone to go out of business when Mother Nature, as she is wont to do, unleashes on the Sunshine State.

Another factor making business difficult, insurers say, is out-of-control litigation.

Florida lawmakers have aggressively tackled this issue in recent years. In December 2022, Gov. Ron DeSantis signed into law a bill that addressed prominent drivers of litigation costs.

Shortly thereafter, in March 2023, Gov. DeSantis signed more comprehensive legislation, with implications across all lines of Florida insurance. The bill broadly aimed to "decrease frivolous lawsuits and prevent predatory practices of trial attorneys who prey on hardworking Floridians," according to a press release announcing the new law.

This article will examine how Florida's recent tort reforms are playing out and how actuaries are unpacking their effects. It will also consider what other reforms may lie ahead in Florida.

December 2022 and March 2023 tort reforms

December 2022: Senate Bill 2-A becomes law

For Brian Donovan, FCAS, chief actuary for Citizens Property Insurance Corp., Florida's state insurer of last resort, the most impactful tort reforms came in SB 2-A.

"That legislation directly addressed the root issues, and it did so by doing two things: one, eliminating the use of assignment of benefits and two, eliminating the one-way attorney fees" for property insurance, Donovan says.

Assignment of benefits

Previously, policyholders could assign the benefits to contractors who would offer to fix the problem and deal with insurance themselves.

"If you had a situation where you had water damage that was covered, quite often the insurance company's first notice of loss would be an invoice for, you know, X fans to dry out the place and Y dollars of damage. And the insurance company had no say over whether there was a need for X fans or half of X fans," says Joe Petrelli, ACAS, president and co-founder at Demotech, a financial analysis firm and ratings agency serving the insurance industry.

One-way attorneys' fees

When a plaintiff wants more than what the insurance company is offering and heads to litigation, eventually that claim will be settled. Previously, Florida's policy of one-way attorney fees said that if the claim was settled for even one cent more than the insurer's initial offer, they were on the hook for all the plaintiff's attorney fees.

This is obviously a substantial expense and, in many cases, could even exceed the indemnity payment. SB 2-A

> **"Everyone knows the reason everyone's losing money is because of litigation. And if they believe the litigation issue has been resolved, then there's an opportunity."**
> **– Brian Donovan**

got rid of this practice in property insurance cases.

March 2023: HB 837 becomes law

This was followed up in late March 2023 with another new law decreasing insurers' litigation liabilities and damages, as well as kneecapping the legal fee structure for plaintiffs' attorneys and cutting the statute of limitations for negligence lawsuits in half, from four years to two years.

As the bill moved its way to the governor's desk, it prompted a raft of lawsuits to be filed before becoming law. The month it was signed, civil filings surged 28% from the month before to 3.58 million — eclipsing the monthly record high, set in August 2022, by 10%.

So, were the reforms successful?

When Gov. DeSantis signed SB 2-A in December 2022, a press release announcing the signing touted it as "the most significant property insurance reform bill in recent history which helps to stabilize our property insurance market, increase competition and strengthen consumer protections."

This language gets at the heart of the first end goal of the legislation, which was, broadly speaking, to make Florida's property insurance market healthier.

The second end goal of that tort reform bill was essentially to help the consumer by striking at the ever-rising cost of insurance coverage.

"We are all feeling the effects of inflation and rising insurance premiums, so we took action to deliver consumer driven reforms that expedite the claims process and curb frivolous lawsuits

that drive up costs," said Florida House Speaker Paul Renner in the same press release.

Let's evaluate whether those goals have been reached.

- Did the law make the insurance market healthier?
- Did insurance become more affordable?

Did tort reform make the insurance market healthier?

When I interviewed Petrelli in April, I asked him whether Florida insurance markets had become a better place to do business since the reforms went through. His response was unequivocal: "Yeah. [Florida Insurance] Commissioner Yaworsky just issued a press release earlier this year. I think there's been eight companies that have entered the marketplace in 2024," Petrelli said.

I asked Citizens' Brian Donovan about early indications showing more private insurers entering the Florida market. Are the tort reforms related to that?

"I think it's absolutely related to this legislation," Donovan says. "Prior to these reforms, I don't know if you looked at the financials for the industry … [these companies have] lost billions of dollars," he says.

So why, Donovan asks, would insurers start flocking to a market where losing money is the status quo?

It's because "everyone knows the reason everyone's losing money is because of litigation. And if they believe the litigation issue has been resolved, then there's an opportunity," Donovan says.

For most property insurers, "opportunity" isn't the first word that comes

to mind when looking at the numbers in recent years.

"Industry results last year, while it was still the eighth consecutive year of an underwriting loss for the property-casualty industry in Florida, it was a much smaller loss than prior years," says Mark Friedlander, director of corporate communications at the Insurance Information Institute.

Excluding the state-sponsored insurer, the Florida property-casualty industry posted $191 million in underwriting losses in 2023. That's not a banner year for any industry, but it's much easier to stomach than the $1.8 billion loss in 2022 or the $1.52 billion shortfall in 2021.

Plus, after factoring in more than $340 million in investment income, the industry ended up posting an operating profit of more than $147 million in 2023, according to an analysis by S&P Global Market Intelligence.

It was the industry's first profitable year in the state since 2016.

Friedlander says that without the tort reforms, "Florida's market would have continued to deteriorate and most likely we would have seen more insolvencies. There's been no insolvencies now since February of last year."

Another way to evaluate the health of Florida's property insurance market is to look at how reliant Floridians are on Citizens, the government entity created in 2002 to offer property insurance to those who can't find coverage in the private markets.

A healthy market would see a "depopulation" of Citizens — meaning fewer folks turning to the state's insurer of last resort for coverage.

There's been improvement on this front: As of May 24, there were 1.19 million Citizens policies in force, down from 1.30 million in May 2023 and below its peak of 1.41 million in September 2023.

Did insurance become more affordable?

Florida's tort reforms have been successful in bringing down insurance-related legislation, attracting more insurers to the market and depopulating Citizens, but there's an elephant lurking in the room when evaluating these new laws, and it's time to address it.

Property and casualty insurance in Florida has only gotten more expensive since the passing of these laws.

"According to the Insurance Information Institute, homeowner's insurance has increased 102% in the last three years in Florida and costs three times more than the national average," with the average home insurance policy costing about $6,000, the highest of any state, according to a January report from a Tampa Bay FOX affiliate.

"I don't see rates ever coming down. . . I see increases moderating," Petrelli says.

This is a point worth ruminating on. Limiting litigation has helped woo insurers back to the Florida market. But if smaller, more predictable litigation costs and more competition doesn't ultimately serve the end goal of bringing down rates for policyholders, on what level are these reforms good for Florida policyholders and citizens?

While perhaps cold comfort to cash-strapped Floridians, it's certainly true that consumers would prefer insurance premiums that rise less violently than they would have otherwise.

But given the language of that December 2022 press release citing "rising insurance premiums" and "frivolous lawsuits that drive up costs," you'd be forgiven for expecting the legislation to actually reduce premiums.

That hasn't happened. And opponents of the reforms argue that despite being sold in part as a way to protect consumers, tort reform has done the exact opposite to boot.

Critics of Florida's tort reform: New laws benefit insurers at the public's detriment

Another reasonable way to evaluate laws is to do so from the point of view of the stakeholders affected by them.

You might split the stakeholders here into two groups:

- Current and future writers of P&C insurance in Florida.
  - The millions of P&C policyholders in Florida (there are more than 7.5 million property insurance policies in Florida).

Tort reform has been unambiguously good for the first set of stakeholders. But critics say it's the second set of folks that's been harmed.

"I'm not saying there's not a lot of litigation in Florida, but the reality is that Florida insurers have a reputation for denying legitimate claims and forcing people to go to court against them," says Joanne Doroshow, executive director of the Center for Justice & Democracy at New York Law School.

You can't just look at raw figures showing a high amount of litigation against Florida insurers and conclude that the legal system is being abused, Doroshow says.

"The first thing I would want to know is: Why do people feel like they need to sue their insurance company? And I would say 95% of the time it's because the insurer has denied a legitimate claim or has lowballed the claim in some way," she says.

A March 2023 investigative report by *The Washington Post* found emails detailing "how independent adjusting firms followed orders from carriers to write claims in specific ways that significantly reduced payouts" to policyholders in the wake of Hurricane Ian in 2022.

"I think you need to balance trying to prevent abuse of the legal system with consumers' access to some mechanism to get a fair claim settlement or get fair treatment," says Birny Birnbaum, director of the Center for Economic Justice, a consumer advocacy organization.

"If you have a situation in which a number of companies were systematically lowballing claims settlements, as evidenced by The Washington Post investigation, then limiting consumers' access to the courts. . . isn't going to improve the claim settlement process — it's going to put even less pressure on those companies that don't want to treat consumers fairly," Birnbaum says.

For Birnbaum, not only did Florida tort reforms unfairly punish millions of Florida consumers, but they did so while
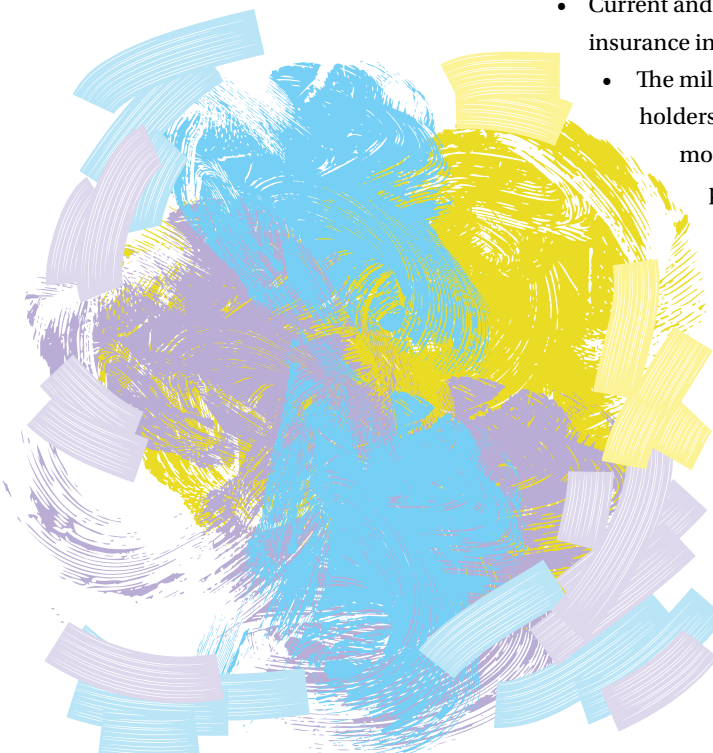
ignoring the real culprit sending rates into the stratosphere: reinsurance prices.

"After the major carriers left the Florida market after Hurricane Andrew, the state decided on a strategy of allowing thinly capitalized insurers who write only in Florida, or Florida and Louisiana, to come into the state. Those companies rely highly on reinsurance," Birnbaum says.

"The companies that were failing were giving away 75% of their premium to reinsurers … if you're dependent to such a huge extent on reinsurance, and you have an unregulated reinsurance market that can double its prices overnight, then you're going to have huge increases in homeowners' insurance rates," Birnbaum says, adding that it's a recipe for insolvencies as well.

"The cost of reinsurance has to cover what the reinsurers believe they're going to pay out in claims. So, it's going to be their average expected claim costs, in any particular year, plus their administrative costs, plus the profit they want to make. Well, in an unregulated market, they can set the profit anywhere they want," Birnbaum says.

It should be noted that Florida reinsurers aren't *literally* unregulated — they're required to get an actuary to sign off on the adequacy of loss reserves held by intermediary brokers or managers, for example — but unlike insurers, they aren't legally required to submit rate filings for approval with state regulators. This allows reinsurers the sort of broad discretion in setting prices that insurers themselves do not enjoy.

When reinsurers set high prices, the cost is ultimately passed on to policyholders by necessity, as insurers are forced to seek higher rates in rate filings to cover reinsurance costs.

How actuaries are unpacking the laws

While different stakeholders debate the impact of the laws, actuaries themselves have already incorporated them into their work.

Citizens' Donovan shared a little about how the reforms affected rate indications at Florida's insurer of last resort.

"For Senate Bill 2-A, we made very specific adjustments in projecting what our ultimate costs would be based on this," Donovan says, explaining that the effects started to be incorporated into policies effective June 1, 2023. As of June 2024, all policies are governed by the law.

Donovan talks about how Citizens factored in the new policy language as it updated 2024 rates in late 2023.

"What we did is we went and looked at the prior expenses and prior patterns and broke that into litigated and non-litigated. We, in projecting forward, gave more weight and consideration to the non-litigated costs, to the non-litigated loss development patterns and to the non-litigated loss trend selections," Donovan says.

Citizens, by design, charges actuarially unsound rates — but it still needs to calculate what actuarially sound rates would be, if it could charge them.

Without taking the reform into account, the uncapped indicated rate increase would've been 89% for 2024 policies, Donovan says.

"But then we went in and said, 'Well, let's go look at the litigation costs. That's driving the cost. Let's temper them to reflect what we think is going to happen with this new bill.' And that drops that overall indication to 55%,"

When reinsurers set high prices, the cost is ultimately passed on to policyholders by necessity, as insurers are forced to seek higher rates in rate filings to cover reinsurance costs.

Florida has overhauled tort law for the insurance industry in the last few years, but it might not be done just yet.

Donovan says.

While Citizens policyholders haven't seen or felt the impact of tort reform on their rates — rate increases are capped at 13% per year for primary residences — the reforms do help Citizens in the long-run as it engages in a glide path towards charging actuarially sound rates.

Third-Party litigation funding: The next tort to sort?

Florida has overhauled tort law for the insurance industry in the last few years, but it might not be done just yet.

Third-party litigation funding (TPLF) is the practice of a third party financing a plaintiff's lawsuit in exchange for a chunk of the eventual judgment or settlement. Many in the insurance industry would like more transparency around the practice.

"We are a strong supporter of transparency in third-party litigation funding," says the Insurance Information Institute's Friedlander.

These third parties include hedge funds and other financial firms seeking above-average returns by investing in all sorts of lawsuits, from personal injury cases and class actions to contract breaches and arbitration, Friedlander says.

The Florida legislature was moving forward on a bill in early 2024 to address TPLF transparency, but it was blocked by the Florida House, and for a simple reason, Friedlander says: "Many members of the Florida House are members of the trial bar."

Still, Friedlander doesn't think it's over. "We expect the legislation to be reintroduced next year," he says.

Of course, consumer advocates have a different take on TPLF transparency — and why the insurance industry is pushing for it.

Doroshow says that issues like this tend to rise to the attention of legislators during "hard markets" — when the country experiences insurance crises and rates shoot up for a number of years before stabilizing. We're in such a market right now, Doroshow says.

"Whenever these hard markets hit … the insurance industry will decide on a set of legal restrictions on people's rights that they want to try to lobby for," Doroshow says.

This time the insurance lobby has chosen transparency in TPLF, an issue she says is actually about insurers gaining a litigation advantage in big cases; they hate the fact that there can be independent funding for such causes.

As for the argument that TPLF results in legal system abuse, Doroshow rejects it outright.

"What they don't say is litigation finance firms only get involved in a case after they've invested money in a very extensive risk assessment of the case. They only get paid if the case is successful. . . so we're talking about a case, if it gets this kind of funding, it's a legitimate case," Doroshow says.

"There's no increased cost to the system because these are legitimate cases that should be brought and won," Doroshow says.
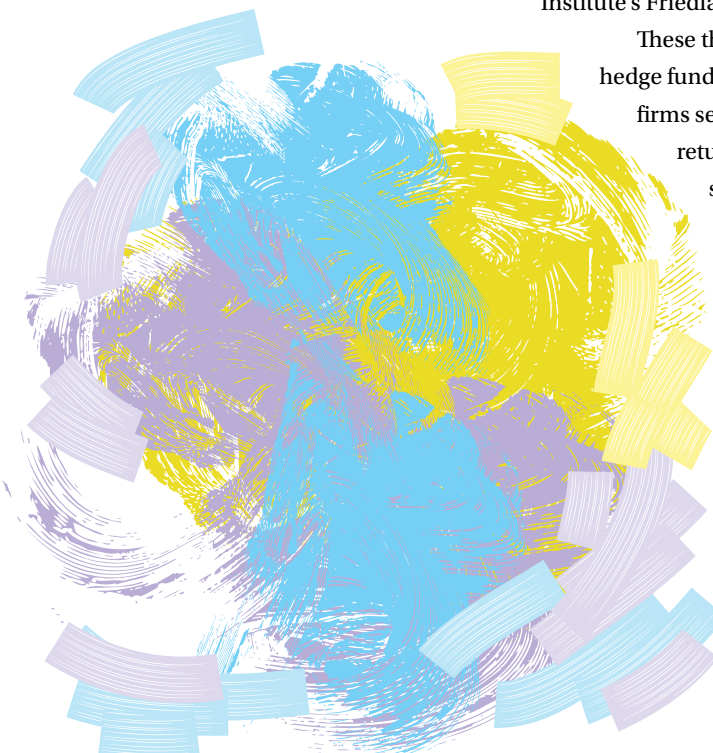
Deliberations

At the end of the day, were Florida's tort reforms successful or not? The answer to that question depends on who's asking it.

The tort reforms have been objectively good for insurers, who enjoy far more legal protections than before. The health of the Florida property insurance market, as measured by new entrants, the depopulation of Citizens, and even the P&L of the industry as a whole, is on the up-and-up.

For your average Florida policyholder, it's frankly harder to point to big wins from the reforms. Depopulating Citizens *would* be an objective win for all Florida policyholders, as the healthier the insurer of last resort is, the less likely it is to need to levy assessments on them to pay out its claims.

But while fewer folks are relying on Citizens today than a year ago, those numbers have been ticking in the wrong direction in recent months. It's just a little too early to declare victory.

Also, property insurance remains unaffordable for many in Florida. And in the view of consumer advocates, reforms have missed the mark. Insurance is a business that is made to pay out on legitimate claims, and Florida's tort reforms make consumers less able to collect on the claims that are legitimately owed.

And while the insurance industry wants to continue on the tort reform path, potentially looking to TPLF reform next, Birnbaum says the industry is simply focusing on the wrong thing.

"If litigation was the problem, why wouldn't the so-called tort reform that was passed immediately lead to lower insurance premiums? It hasn't. What that tells me is that it's the ongoing high cost of reinsurance" that's the real driver of ever-higher, less affordable rates, Birnbaum says.

For Birnbaum, the path to making property insurance more affordable and accessible in a state like Florida instead requires a renewed focus on factors like loss mitigation and the reinsurance market.

He also wonders how robust Florida's new-and-improved insurance market really is.

"There's certainly more companies now in the market ... but there haven't been any events," he says. The 2023 U.S. hurricane season was the tamest in almost a decade.

"What will happen if we get two major hurricanes in a season? Will those companies continue to be around? History tells us no," Birnbaum says.

Time will tell. But one thing's for sure: If Florida property insurers do suffer a rough patch in the coming years and start going insolvent, billboard lawyers will be less likely to be to blamed. ●

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John Divine is a financial writer and editor with bylines for The Motley Fool, Yahoo! Finance, U.S. News & World Report, and InvestorPlace.com, among other outlets. He has also written on actuarial issues for Contingencies, a publication from the American Academy of Actuaries.

ETHICAL ISSUES

The Actuary's Guide to the Code of Professional Conduct (Part II)

By MELISSA HUENEFELDT, PROFESSIONAL EDUCATION WORKING GROUP CHAIRPERSON

n this issue, we continue from where we left off in the last column and wrap up with the remaining Code precepts. We also review the candidate codes of ethics for the CAS and SOA.

Precept 7: Conflict of Interest

"An Actuary shall not knowingly perform Actuarial Services involving an actual or potential conflict of interest unless: a) the Actuary's ability to act fairly is unimpaired; b) there has been disclosure of the conflict to all present and known prospective Principals whose interests would be affected by the conflict; and c) all such Principals have expressly agreed to the performance of the Actuarial Services by the Actuary."

If you are providing Actuarial Services for both the buyer and the target during a merger/acquisition, you need to disclose this to both parties and get express permission to continue. The Actuary also has to be fair and unbiased when performing these services.

Precept 8: Control of Work Product

"An Actuary who performs Actuarial Services shall take reasonable steps to ensure that such services are not used to mislead other parties."

Some examples: If you provide a range of reserves in your actuarial report with the sole intention of demonstrat-

ing the volatility of the estimates, then you must clearly disclose the purpose of the range to avoid misinterpretation that any value in the range would be appropriate to use.

Recalling Precept 2, if you don't meet the requirements set forth by the U.S. Qualification Standards (USQS) (i.e., basic education, CE or experience) and intentionally withhold this information from your Principal, it could potentially mislead the users of your Actuarial Services into believing you are fully qualified to provide the work product.

Precept 9: Confidentiality

"An Actuary shall not disclose to another party any Confidential Information[1] unless authorized to do so by the Principal or required to do so by Law."[2]

A violation of this precept can arise from sharing confidential information, even if from accidental or unintentional means. If you leave your computer unlocked in a public place, and an unintended user gathers confidential information as a result, it may be a violation of Precept 9.

Precept 10: Courtesy and Cooperation

"An Actuary shall perform Actuarial Services with courtesy and professional respect and shall cooperate with others in

the Principal's interest."

As a professional, this precept should be easy to obey; however, there may be times when working with others may create an adversarial circumstance. For example, if you previously provided Actuarial Services for Company XYZ, but you were fired after that assignment, you may have bad feelings about the situation. If a new actuarial firm is reviewing your work and wants to discuss your work product, Precept 10 says that you must be courteous and cooperative.

Another example of a potential violation of this precept is if you continuously ignore a Principal's call because you know they are upset with the results from your actuarial study and don't want to face them. You would be violating Precept 10 and Precept 1 by not acting with integrity.

Precept 11: Advertising

"An Actuary shall not engage in any advertising or business solicitation activities with respect to Actuarial Services that the Actuary knows or should know are false or misleading."

If you advertise your services, a violation of this precept would be to claim that you are faster, cheaper and more adept than a prospective client's current Actuary. Any claims should be based on fact and not personal opinion.

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[1] The Code defines "Confidential Information" as "information not in the public domain of which an Actuary becomes aware as a result of providing Actuarial Services to a Principal. It includes information of a proprietary nature and information that is legally restricted from circulation."

[2] The Code defines "Law" as "statutes, regulations, judicial decisions, and other statements having legally binding authority."

Precept 12: Titles and Designations

"An Actuary shall make use of membership titles and designations of a Recognized Actuarial Organization (RAO) only in a manner that conforms to the practices authorized by that organization."

If you don't fulfill USQS requirements as an FCAS or aren't current on your CAS dues, you can't use your designation. Actuarial candidates who have passed their final exam for Associateship may be tempted to use the credential immediately; however, they need to receive approval and express permission from their RAO before they add it to their signature.

Precepts 13 and 14: Violations of the Code of Professional Conduct

"An Actuary with knowledge of an apparent, unresolved, material violation of the Code by another Actuary should consider discussing the situation with the other Actuary and attempt to resolve the apparent violation. If such discussion is not attempted or is not successful, the Actuary shall disclose such violation to the appropriate counseling and discipline body of the profession, except where the disclosure would be contrary to Law or would divulge Confidential Information." (Precept 13)

If you are reviewing another Actuary's work product and find inappropriate assumptions with inadequate documentation that have a substantial impact on the outcome of the analysis, Precept 13 states that you should consider discussing this with the other Actuary. It

does not say to immediately report it to the Actuarial Board for Counseling and Discipline (ABCD). Like Precept 10, this conversation may be uncomfortable, but a discussion with the other Actuary may help to clarify their actions.

If you've made a reasonable attempt to contact the other Actuary to no avail, then a discussion with the ABCD may be warranted. The ABCD is not a disciplinary body,[3] but it does offer guidance and confidential counseling.[4]

"An Actuary shall respond promptly, truthfully, and fully to any request for information by, and cooperate fully with, an appropriate counseling and disciplinary body of the profession in connection with any disciplinary, counseling or other proceeding of such body relating to the Code. The Actuary's responsibility to respond shall be subject to applicable restrictions on Confidential Information and those imposed by Law." (Precept 14)

If the ABCD reaches out to you, it is in your best interest to respond to it in a timely manner and to answer its inquiries to the best of your ability. The ABCD is a body that helps our profession stay self-regulated by ensuring that we are all exercising skill and care.

What professional code do actuarial candidates need to follow?

While actuarial candidates are not subject to the Code, they still must perform and behave in a way that protects and elevates the reputation of the profession.

The SOA[5] and the CAS[6] have their

own sets of rules that are specific to candidates. There is a lot of overlap with the Code, but some rules are more specific to the actions of a candidate.

Rule 1 of both the SOA Candidate Code of Conduct and the CAS Candidate Code of Ethics aligns with Precept 1: "An actuarial candidate shall act honestly, with courtesy, integrity, and competence, to uphold the reputation of the actuarial profession." An actuarial candidate doesn't have the same responsibilities as an Actuary, but they have the same expectations of behavior. Other candidate rules overlap with Precepts 9, 10, 12 and 14.

Both sets of rules for candidates include a rule discussing the adherence to the examination discipline policy. It's important for actuarial candidates to realize that, even though they don't yet carry the actuarial designation, their actions could prevent them from achieving that goal if they are in violation of their actuarial organization's rules.

Act with professional integrity

When I tell people that I'm an actuary, I am greeted with awe and respect (after the comments about their rising auto rates). That is a direct result of how effectively our profession maintains its reputation through following the Code, USQS and the Actuarial Standards of Practice.

With our adherence to the Code, we can continue to foster this respect for generations of actuaries to come. ●

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[3] The ABCD receives complaints of violations of the Code and conducts investigations; however, the violating member's RAO is responsible for determining the appropriate discipline.

[4] For information on how and when to request guidance from the ABCD, visit: https://www.abcdboard.org/standards/guidance/.

[5] SOA Code of Conduct for Candidates: https://www.soa.org/4ae133/globalassets/assets/files/edu/edu-code-cond-candidates.pdf.

[6] CAS Code of Professional Ethics for Candidates: https://www.casact.org/exams-admissions/resources/principles/candidate-code-ethics.

Cyber Help, At Home and Work By JIM LYNCH

At work, a lot of actuaries price cyber insurance policies. At home, all of them should be thinking about cyber protections.

That was the message from CAS Fellow Eduard Alpin at the CAS Spring Meeting in his talk, "Cyber Resilience for Companies and Individuals." Alpin is chief actuary at Resilience, a company that helps its corporate customers manage their cyber exposures.

High-profile corporate incidents like the cyber attack that roiled MGM Resorts International last year have their at-home counterparts. Alpin illustrated the parallels. He cited real-life and hypothetical examples.

Alpin spelled out the basics of cyber controls and showed what can happen — in business and at home — if common cyber controls aren't followed. Controls included Identity and access management, and social engineering protections.

Identity and access management

These protections ensure that the right people are performing the tasks that they should. Techniques include managing and verifying passwords and limiting access.

Password management. Alpin recommended using password managers, which generate unique, complex passwords every time you need one. When you access that site later, the manager logs you in automatically. Password managers deter two types of attacks:

- *Brute force*, where a bad actor just keeps trying common passwords (think: ABCD1234) on a site till one works.

- *Credential stuffing*, where the hacker tries passwords pulled from one hacked site on another site, like a bank.

In 2022, business publication *Fast Company* was breached when the password used by one of its employees ("Pizza123") was hacked from another site. The employee used the same password on their *Fast Company* profile. The result: Hackers stole data and pushed out offensive notifications under *Fast Company*'s name.

An example of an at-home equivalent to a credential stuffing attack is where hypothetical actuaries use the same password ("Actu@ry24") on all their accounts. The password contains a capital letter, numbers and a special character, so they think it is secure. But a hacker recovers the password from one site, then tries the credentials at a series of bank sites until it works.

At home, Alpin noted, password managers are particularly important. Most people have more personal log-ins than work-related ones.

Multi-factor authentication (MFA). Most people are familiar with these, Alpin said. A person signs on, then gets a separate request — usually a code sent via text or email — asking them to confirm they are indeed signing on. An MFA would likely have foiled the *Fast Company* hackers, Alpin said.

Privileged access management (PAM). Here, employees only receive access to the computer tools they need to do their job. Actuaries, for example, don't "need access to production development code," Alpin said. If the actuary's account is hacked, PAM prevents the hacker from finding sensitive informa-

tion elsewhere.

Social engineering protections

Social engineering attacks involve bad actors tricking employees to send them money or valuable information.

Phishing is the best known example: sending a fraudulent email that seems to come from a reputable source. It has variants, including voice messages ("*vishing*") and SMS messages ("*smishing*").

"There's a lot of '*ishings*' in cybersecurity," Alpin said.

Another variant are *deepfakes,* where AI tools are used to generate a voice or image or video of a person doing something they have never done. If there is video of you online, Alpin said, cheap, easy-to-use editing tools can swap your image onto something you have never done.

Even if the fakes are identified before they create financial harm, Alpin said, they can create reputational harm.

A California couple lost $160,000 when scammers pretended to be their escrow agents for a home sale. The hackers were monitoring the actual agents, so were able to intercept the money they had induced the couple to send.

"This has been happening for years," Alpin said. "It's really sad because people can lose their life savings."

Taking control at home and work

"It's really important to train people to avoid falling for social engineering threats," Alpin said. He shared dos and don'ts:

Do:

- Question the source of unsolicited information.
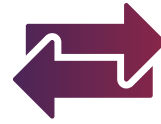
- Call the counterparty directly to confirm requests.
- Visit the trusted website directly (instead of clicking a link that the suspicious actor has sent).

Don't:

- Click on links.
- Respond to emails.
- Respond to texts.
- Share personal information.
- Share passwords, PINs or one-time codes.

He recommended making an old-fashioned phone call to confirm an electronic beckoning is legitimate.

That might have helped the victim of an elaborate deepfake early this year in Hong Kong. He was instructed on a video call to make a payment by his CFO. Everyone else on the call, including the CFO, was a deepfake reproduction. The victim forwarded $25 million (U.S.) to the bad guys.

Recent scams combine social engineering and password management. A bad actor (who has already stolen your password) pretends to be from your bank and calls to warn of suspicious activity on your account. To check things out, they recommend you sign on with them on the phone and give them the code sent for multi-factor authentication. When you do, they can get into your account and drain your savings.

Viruses often arrive this way. Businesses can adopt antivirus and endpoint detection and response solutions. The latter monitors devices to detect and respond to threats like ransomware and malware.

The at-home equivalent is using one computer for transactions like banking and another for fun activities like gaming. That way, a child who accidentally downloads malware might mess up their own computer, but they won't provide access to the family bank account.

Both businesses and families should back up data periodically, Alpin said. It's an important control; Alpin's company regularly looks for it when underwriting clients. Backups should be frequent. There should be three backups. One should "air-gapped," meaning it is completely separate from all computers and the internet.

Good cyber controls work at home as well as at work, Alpin said.

"There are interesting parallels between what companies see as important and what individuals can benefit from in their everyday lives." ●

Jim Lynch, FCAS, MAAA, is retired from his position as chief actuary at Triple-I and has his own consulting firm.

Navigating through the Dynamic Property Insurance Market

By DALE PORFILIO

Catastrophes and inflation are combining to force property insurers and reinsurers to increase prices in record amounts to offset higher expected losses. In 2023, the U.S. experienced 28 catastrophic events, with each causing more than one billion dollars of damage. This followed a period during which replacement costs for home repairs increased significantly more than economic inflation.

The first general session of the 2024 CAS Spring Meeting focused on the state of the property market. Pat Abbe, U.S. regional and mutual strategic growth leader at Aon, provided the reinsurance perspective. Howard Kunst, chief actuary at CoreLogic, followed with an overview of the primary insurance market.

Abbe started with the question, "Why did everyone start talking about reinsurance late in 2022?" His answer started with a return to introductory economics — the law of supply and demand. As of September 30, 2022, global reinsurers' capital dipped to $560 billion from $675 billion at end of 2021. Traditional equity returned to levels last seen in 2012, mainly driven by unrealized investment losses. This caused a contraction in reinsurance supply for renewals effective January 1, 2023.

Concurrently, primary carriers were experiencing increased inflation and the third consecutive year of elevated catastrophes, capped by Hurricane Ian making landfall in September 2022 in one of the costliest insured loss events on record globally. This increased demand for reinsurance as primary carriers sought to cede higher expected losses.

As any economic professor would tell their students, increased demand and reduced supply leads to higher reinsurance prices. Many ceding insurers accepted higher retentions to mitigate the higher reinsurance prices.

As we entered 2023, ceding insurers needed to incorporate the higher reinsurance expense alongside higher expected loss costs in their property rate filings, worsening the affordability of homeowners and commercial property insurance. Some primary carriers made the very tough decision to reduce their policies in force in high-risk markets, with approaches ranging from taking on less new business in those markets to exiting entire product lines.

The reinsurance industry then lived through 2023. P&C industry net combined ratio for primary insurers stayed above 100, driven by inflation and record severe convective storm (SCS) losses. Meanwhile, reinsurers' financial results improved, with net combined ratio approaching 90, showing the benefit of increased cedent retentions — causing catastrophe losses to be largely retained by the primary market — and improved investment income. Global reinsurer capital rebounded by 8% as the 2024 renewal season approached.

Abbe then recapped 2024 and looked ahead to the future. He offered five key themes from reinsurance renewals effective January 1, 2024:

- Underwriting actions — Net retention increases paired with inflation and catastrophes drove increased primary carrier underwriting actions.

- Results disparity — Reinsurers outperformed primary P&C insurers, especially SCS-exposed regional carriers.

- Capital recovery — Strong reinsurer results resulted in improved supply/demand dynamics.

- Segment differentiation — Renewal outcomes varied by segment with peak perils (i.e., hurricane and earthquake) property catastrophe programs faring well, Midwest regionals facing numerous challenges, and overall ample casualty capacity available.

- Opportunity, optimism — Many reinsurers had unused capacity after January renewals were completed, so opportunities exist for primary carriers to fill gaps or find additional coverages.

Mid-year placements (heavily concentrated in Florida property exposures) were in the market at the time of this presentation, but early indicators were generally favorable. Pricing improvement and consistency in terms were common. Stronger reinsurer capital capacity, in part from 2023 earnings, contributed to broader appetite for larger lines with more flexibility for supplemental covers or lower coverage layers than in 2023.

Kunst started his primary property insurance market update by sharing research from the Insurance Information Institute (Triple-I). The industry experienced homeowners underwriting losses every year from 2020-2023, driven by loss-cost inflation and catastrophes. The 2023 net combined ratio was the

worst since 2011. Net written premium growth of 12% is the highest in over 15 years, reflecting rate increases to offset higher losses due to inflation. Per Triple-I's projection, loss experience is expected to improve in 2024 and 2025, but the industry is expected to remain unprofitable.

Digging deeper, only three of the 20 largest homeowners groups achieved a 2023 net combined ratio below 100, and only four of the 20 had improved direct combined ratios in 2023 from 2022. Using CoreLogic's replacement cost tools, homeowners estimated replacement cost values (RCV) increased cumulatively from 2020 to 2023 in the range of 22%-36% by state. This reflects inflationary loss costs and contributes to the increase in homeowners premiums.

RCV increases are being driven by types of both material and labor costs. When comparing November 2023 to November 2018, PVC pipe has gone up 125% while lumber increased by 5%, with several others clustered around 40% increases. That said, lumber had the greatest volatility in costs within the five years. Labor had lower variance by type, with lathers increasing 20% and carpenters at 15% across the five years, with significant volatility through the pandemic.

With regard to rising catastrophe losses, Kunst said the biggest underlying cause is the exposure growth — total number and value of homes and businesses where these catastrophe events are striking. This upward trend accelerated after 2005, driven by the number and cost of SCS events.

Wildfires are by their very nature immensely volatile. Fire suppression methods have improved, helping reduce the number of fires over the last two

January 1, 2023

Supply and Demand Drives Pricing

decades. However, acres burned and the number of structures destroyed are not trending down as more homes are built in the wildfire urban interface and severe events are still occurring.

Florida and Louisiana have been the two states with the worst homeowners insurance affordability metrics for many years running. In both states, it is the combination of climate risk, legal system abuse and inflation that has led to their current affordability and availability challenges.

California's challenges, by contrast, are significantly impacted by regulatory restrictions which limit rate adequacy and underwriting accuracy. For example, primary carriers are not permitted to incorporate reinsurance expense into their homeowners pricing indications, which caused some of the market disruption when reinsurance prices spiked upward in 2023. Fortunately, the California Department of Insurance is working with the industry to modernize

their regulatory regime.

Kunst concluded with two projections from the Triple-I:

- Industry underwriting losses are projected to continue for homeowners through 2025.
- Availability and affordability of property insurance will remain a concern in high-risk markets throughout 2024.

This general session provided a good overview of the combined primary insurance and reinsurance market dynamics contributing to these challenging times. Watching a replay of this live presentation is a worthy investment for anyone working on property product lines. 🟡

Dale Porfilio, FCAS, MAAA, is the chief insurance officer for the Insurance Information Institute and president of the Insurance Research Council.
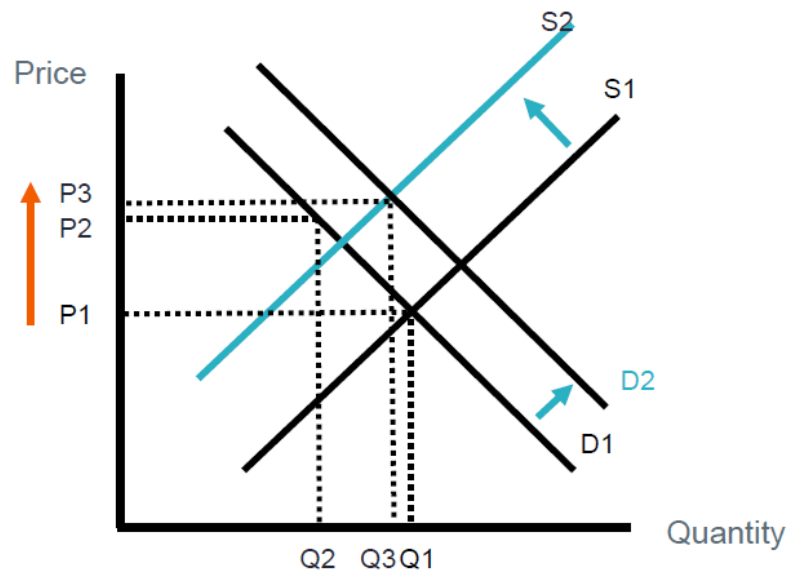
Algorithmic Bias is the Latest Consideration Within Risk-Based Pricing Modeling By DALE PORFILIO

The *CAS Statement of Principles Regarding Property and Casualty Insurance Ratemaking* is a foundational document for any pricing actuary. Its introduction emphasizes the critical role of employing proper actuarial procedures to derive rates that "protect the insurance system's financial soundness and promote equity and availability for insurance customers."

This involves compliance with four criteria for actuarially sound rates:

- Reasonable
- Not excessive
- Not inadequate
- Not unfairly discriminatory

The CAS has committed to providing industry-leading research to balance these principles within insurance pricing applications. This commitment led to the Series on Race and Insurance Pricing, a group of four CAS Research Papers released in 2022. Now, the CAS and its many volunteer members are preparing to release a Phase II of the series in 2024.

The recent CAS Spring Meeting included a concurrent session providing an overview of the latest race and insurance pricing series before going deeper into two of the papers. CAS Fellow Mallika Bender, diversity, equity & inclusion staff actuary at the CAS, moderated the session and provided an overview of the series. She noted that these papers reflect the latest understanding of race and algorithmic bias, but that regulator and consumer perspectives on these topics are continually evolving.

Scott Merkord, consulting actuary at Risk & Regulatory Consulting LLC (RRC), and Rich Moncher, senior consultant at Octagram Analytics, provided an overview of the research into regulatory perspectives on algorithmic bias and how actuaries can prepare. Merkord and his RRC colleagues conducted the survey of regulators and will be authoring the first paper. Moncher and his Octagram colleagues will be writing the second paper.

Recent regulatory and legislative actions in the United States are emanating from the NAIC and individual states, as well as the federal government. In 2020, the NAIC formed its Special Committee on Race and Insurance, culminating in the issuance of its "Model Bulletin regarding the Use of AI Systems by Insurers" in 2023. They have also issued model review questionnaires and have the Cybersecurity and Technology (H)

Figure 1. Phase II of the CAS Research Paper Series on Race and Insurance Pricing

- Regulatory Perspectives on Algorithmic Bias and Unfair Discrimination
- A Practical Guide to Navigating Fairness in Insurance Pricing
- Balancing Risk Assessment and Social Fairness: An Auto Telematics Case Study
- Potential Unintended Impacts of Bias Mitigation
- Practical Applications of Bias Measurement and Mitigation Techniques
- Comparison of International Regulations on Bias in AI

Committee continuing to focus on all aspects of bias and insurance.

At the time of their presentation, six states (Connecticut, Hawaii, Illinois, New Hampshire, Rhode Island and Vermont) have adopted the NAIC's Model Bulletin. Many other states are actively considering adoption, so this list is expected to grow throughout 2024. Three other states (California, Colorado and New York) have introduced their own regulations.

State regulators and/or legislatures are also taking action. Colorado passed its Senate Bill 21-169 in 2021 addressing unfair discrimination of various protected classes. Their insurance department has since issued guidance for the life insurance industry and is now working on comparable guidance for P&C products. So far, no other state has adopted a "copycat" of Colorado's legislation.

California's insurance commissioner issued Bulletin 202205 in 2022, setting fairness principles to avoid bias in marketing, policy issuance, pricing, fraud investigation and claims handling. The Connecticut Department issued "Big Data and Avoidance of Discriminatory Practices" in 2022. The District of Columbia Department formed its Diversity and Equity Inclusion Committee to explore how to regulate issues of bias in insurance. The New York Department released "Use of AI Systems and ECDIS [External Consumer Data and Information Sources] in Insurance Underwriting and Pricing" in January 2024, while Illinois legislators have introduced bills to dramatically restrict the use of many variables for personal auto on the grounds of unfair discrimination.

U.S. insurers also need to consider the maze of federal civil rights acts. Then they'll need to layer on relevant model acts and laws, such as Unfair Trade Practices Model Act, Unfair Claims Settlement Practices Model Act and Property & Casualty Model Rating Law.

With the table now set, Merkord provided an overview of the underlying research conducted for the "Survey of Regulators on Algorithmic Bias" paper. Risk & Regulatory Consulting sent their survey to all state insurance departments and received responses from ten states. The survey questions focused on three areas: responsibility of insurers with regard to algorithmic bias in their models, concern regarding rating elements utilized in private passenger auto (PPA) and regulatory perspectives on algorithmic bias.

The paper will go far deeper on all their conclusions from the regulator survey, but I found four takeaways to be most interesting.

- Most respondents agree that multiple testing methodologies should be used to identify algorithmic bias.
- Respondents are mixed on whether race should be used to test for algorithmic bias, and many disagree with the use of Bayesian Improved First Name Surname and Geocoding (BIFSG) as a technique to infer race.
- Regarding PPA rating elements, most respondents are concerned about the use of homeownership, occupation, credit-based insurance scores and criminal history.
- Most respondents do not believe evaluating rates for actuarial soundness alone satisfies their concerns surrounding unfair discrimination.

Moncher provided an overview of Octagram's paper entitled "Approaches to Respond to Bias Regulation." An opening key question is: "During which stage(s) of the modeling process should bias and fairness be considered?" Options include project planning, data preparation and exploration, model training, model evaluation and selection, and model implementation.

I will jump to the punchline by sharing their recommendation to consider bias and fairness in *every* stage of the modeling process. Their paper will, and Moncher's presentation did, walk through many ways in which bias should be considered at every stage, regardless of the model application. More poignantly, if it's not considered during project planning, then the organization risks inefficiencies in time and effort by having to loop back to earlier stages of the project when bias is eventually considered.

In closing, Bender encouraged everyone to watch CAS communications for the release of all five research papers. The fifth piece is intended to be a handbook to help practicing actuaries apply new bias measurement and mitigation techniques into their actuarial work. This will help our profession deliver the highest standard of care to the policyholders whom the insurance industry serves every day, consistent with our CAS Statement of Principles.

Editor's note: The sixth and final Research Paper in the series will compare international regulations on bias in AI. ●

Dale Porfilio, FCAS, MAAA, is the chief insurance officer at the Insurance Information Institute and president of the Insurance Research Council.

IN MY OPINION

# Can a Machine Learn to Do Actuarial Work?

Is that the right question? By BETSY WELLINGTON

This essay is one of five essays that were submitted in response to the CAS Publications Department's call for essays on the "Intersection of Artificial Intelligence and Actuarial Science." See the CAS 2024 Summer E-Forum *for three other essays, including the prize-winning essay by Ronald Richman.*

During the COVID lockdown, I found myself unemployed as an actuary for the first time in my career when my previous employer surprised us by shutting down our division. Although I could have taken a different position in the company, I really loved what I was doing and had no interest in doing what I consider more mundane work. Yes, I'm a bit of an actuarial snob, and frankly this has been a lucrative career for me. But after working for 30 years in a dynamic profession that exercised my brain every day, it was hard to just hit the brakes and learn to play pickleball. Instead, I enrolled in an online Data Science Boot Camp with Vanderbilt University[1] and learned how to pickle a machine learning (ML) model. Yes, that is a thing. Google it!

My interest in learning what those data scientists were doing hatched when my prior employer was looking for projects that their new data science team could take on. Although they had hired a team of very bright data scientists, management didn't seem to know what to do with them! Recently, I ran into two similar situations at other companies. I spoke with a young man who had been hired to be a data scientist at a very large multi-national company. He said that there was no job description, and the company didn't know what to do with him, so he was considering the actuarial track instead. Another colleague had a large group of data scientists that didn't understand that lots of data didn't necessarily mean lots of valuable insights.
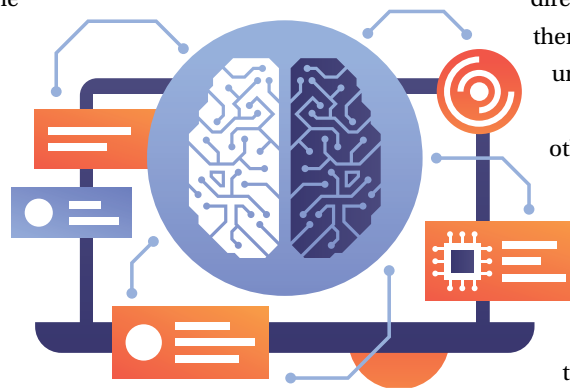
Oh yes, they could program beautiful interfaces, but they just weren't doing anything to help analyze the product. It seems that the insurance industry, in some cases, may feel it needs to get on the data science bandwagon but doesn't know what to do once on board.

In my case, I had a great project that I did not have time to do myself and jumped on the offer to get some free help. For this project, in collaboration with the underwriters, I had already created a rating model that uses government data to calculate a rating score for individual risks. The underwriters were spending many hours looking up the data online then manually typing it into the rating model. With a little digging, I found the online database underlying the needed information. In collaboration with the data scientists, we added a button to the rating model that facilitates going out to the internet to grab the data directly and load it into the rating model thereby saving the company hours of underwriter work on each account.

So why am I sharing this with other actuaries? Well, "data science" may be last year's buzz word for technology, but AI is the current buzz word. From my experience working with data scientists, I could see that data science technology could really help with the efficiency of both underwriting and actuarial work. However, it was clear that neither the underwriters nor the data scientists could identify how to bring it all together. It is the actuaries who have the big picture and really need to be involved with all this evolving technology. As my underwriter colleague puts it, "The main problem is data scientists need to have context with regards to

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[1] https://bootcamps.vanderbilt.edu/data/.

the data they are using. There needs to be a real understanding of the risk and insurance product." Actuaries learn this context through the exam process and master it as part of their jobs. After the immediate success of this collaborative project, I became curious to learn about the technology that data scientists are using. Little did I know that the data science boot camp I signed up for would also lead me down the path of machine learning, which is the backbone to AI. I have decided to write this essay in order to share my observations on machine learning and the role of the actuary.

Background

It is easy to find a definition of artificial intelligence online. According to Britannica, "Research in AI has focused chiefly on the following components of intelligence: learning, reasoning, problem solving, perception, and using language." Frankly, when I was studying machine learning, I wasn't thinking that it was the same as the artificial intelligence that we hear about today. However, according to Google Cloud Services, "ML is an application of AI that allows machines to extract knowledge from data and learn from it autonomously." (Google, n.d.) One definition of machine learning I found while studying how to deploy an ML model is "Machine Learning models are powerful tools to make predictions based on available data" (Sahakyan, 2019). This definition should sound familiar to actuaries since that is exactly what we do — use available data to predict what next year's results, loss costs, trends, etc., will be. We could say that *actuaries* are powerful *humans* that make predictions based on available data. So, it seems that maybe machine learning might be used to replace actuaries . . . or maybe not.

In case you don't know, machine learning involves dividing a dataset into a training portion and a test portion , programming around the training dataset, running the program on the test dataset and evaluating the results of the model using statistical analysis. This process is just like what we do every day as actuaries. We study the data we have, which is our training dataset and come up with models and equations that we then apply to future or new data to make predictions and test the results to see if the model works. It has been shown that AI can make art with DALL.E 2 and ChatGPT can write a great term paper and create an outline for a book. But can AI do actuarial work? I was intrigued.

The boot camp experience

At the end of the boot camp, we had to do a group project using machine learning to create a tool with which users could interact and retrieve desired information. We had to find an online database that was available to the public. Our team chose to use the Airbnb API (application programming interface), which provides information on historic rentals.[2] The first takeaway from this is that there are many datasets available for free or for a fee everywhere. For example, if you want to get Census data from the government, you can directly query the data using their APIs rather than downloading Excel files.[3] We also learned that programmers (and the boot camp instructor) used Google as their main source for figuring out how to code something or find data. So just Google whatever data you are looking for followed by "API."

Using publicly available free data for this project was interesting because the other team members did not seem to have any experience using datasets that have not been vetted and cleaned. Part of data science is using programming skills, usually Python, to clean the data. This process means you have to identify what is wrong with the data in the first place before you can clean it. I found that the other members were not too interested in that part of the project. We ran the common data cleaning algorithms we had learned. But after that, the group kept trying to come up with different ways to look at the data to see if they could improve the statistics rather

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2   [Airbnb API information](#).
3   https://www.census.gov/data/developers/data-sets.html.

than looking at the underlying data itself to see if, in fact, it was good and could be used for predicting anything. When I did a deep dive into the data, it was full of errors, such as duplicate entries and outliers that clearly were not correct. Even though data scientists have tools to clean the data, it takes asking the right questions to find out if there is a problem. For example, once we saw that the averages looked strange, we needed to check the full range of values. When you find a location that rents for $100,000 a night, you might want to question that! (It turned out to be a mansion in Nashville that rented out for movie/music shoots.) So just as in actuarial work, someone must look closely at the data to make sure that it is descriptive of what is being estimated. But that is not usually part of the data scientist's or a programmers' job. So, who is responsible for data integrity?

The end result of the project was that we developed a nice interface with which users could interact, but for which the statistics underlying the information provided showed little credibility. The machine didn't learn very well because the input data was poor. However, there is no reason or way for any user to know that it is a statistically poor app, which means the results cannot be trusted! This, of course, is the problem with AI models — which is the same as with any actuarial insurance model. Garbage in, garbage out. Think about this real-world example. When pricing large accounts, my experience was that the underwriters would remove the largest claims because they felt that these types of claims were "one off" and would never happen again. On one account, as usual, we had only 10 years of data, and there was a very large claim. The underwriters were

arguing to remove this claim. So, when I went back through 20 years of submissions (30 years of data), I found that this one risk had an $80 million claim every three years! And lo and behold, the underwriter experienced an $80M loss on the risk after they wrote it. What if we used the underwriter dataset to train a model to price these risks in the future?

In machine learning models, there are all sorts of ways to attack the learning problem and all sorts of statistics with which to evaluate the results. With this project above, we used multiple types

I have to say that the boot camp was quite intense in terms of how much we learned in a 10-week span. Here is a sampling of tools and resources we explored:

- Anaconda
- APIs
- AWI
- Clone Repository
- Deploying Models
- Flask
- Gitbash
- Github
- Hadoop
- Heroku
- HTML
- Javascript
- JSON
- Jupyter Notebook
- Machine Learning
- Matplot
- Neural Networks
- Pandas
- pgAdmin
- Pickle a ML Model
- Pip install
- Plotly
- Postgres
- Python
- R
- Regex
- Scikit-learn
- Spark
- SQL
- Tableau
- Unsupervised Learning
- VBA
- WeatherPy
- WebApp
- Web Scraping

If this list seems like a foreign language to you, I recommend you consider a bootcamp experience. You can learn a lot and put it to use quickly. Although I am not an expert in any of these applications now, I was able to see how much these tools could help in an actuarial environment. I have never counted how many programming languages I have had to learn over the last 30 years, but it was a lot. It has become too easy to rely simply on Excel to do everything in our jobs. These new technologies can be very useful and in fact make the actuarial job much more efficient.

of ML models and all sorts of statistics to evaluate the models. But none of the different models or statistics ever improved the results. That was because the input data was faulty. This is the problem with all AI. You can go out and grab data everywhere via databases or web scraping tools (yes, we learned that too!), but if the data is not properly vetted, you just don't know what you get. We were able to see the results of other groups' projects, which had sleek front ends with lots of impressive graphics. There is something very alluring about a

dashboard with all the bells and whistles and a sleek appearance. But when the data is fundamentally flawed, that front end is all smoke and mirrors.

AI has created a whole new field of employment called prompt engineers. AI is so dependent on the need to ask the right question in order to get an intelligent response, that they are paying people a lot of money to help design how to ask the chatbot the right questions. This is recognition to some extent that the data underlying this AI application is not complete, and one needs to be very specific about how the question is phrased in order to find the answer. I recommend that everyone go and try ChatGPT themselves.[4] If you ask it for something like, "What are current actuarial loss costs trends?" The answer is: *"I don't have real-time data, and my training only includes information up to January 2022."*

ChatGPT goes on to make a further recommendation:

Keep in mind that actuarial analysis is a complex field that involves predicting future events based on historical data and statistical models. Therefore, consulting with actuaries or experts in the field may provide more detailed and accurate insights into the specific trends you are interested in.

So, currently your actuarial job is secure, at least from ChatGPT. On the other hand, it does a very nice job of giving you a book outline on any subject. I asked it to write a book about my grandmother, who has an unusual name. It came back with an interesting outline about a person living in outer space.

To be fair, ChatGPT provides a disclaimer about the data integrity.

Remember that while I strive to provide accurate and helpful information, I may not always have the most up-to-date or real-time data. If you have a specific task or question in mind, feel free to let me know how I can assist you!

Now that I have learned some of these technologies, I can see how we can use them to streamline a project I have worked on for the last 20 years. I recently published the trend model I developed for medical malpractice indemnity trends.[5] Using data science tools, my colleague, Kristen Clark, and I have put together a Python-based model that organizes and cleans all the National Practitioner Databank[6] data, including accumulating related claims and Fund state claims, and then produces a trend analysis. It used to take two months of work to process one state at a time. Now, it is done in 15 minutes. Our next step is to create an ML model in which we feed the model additional external data to see if we can teach it to predict when the indemnity loss cost will increase again. As AI methods and models become more mainstream, I hope that actuaries will take the time and effort to learn them through a data science or AI bootcamp. The CAS is currently offering seminars on some of the tools listed above, which is a valuable resource.

Conclusion

AI and data science techniques will have a huge impact on the actuary of the future. We will no longer be spending days and nights programming and cleaning data because we will have data scientists to do that for us. Actuaries will be the insurance professionals that design the questions and structure the problems that artificial intelligence will be used to help solve because we have the context with which to do that. With the advent of more advanced data science and AI tools, the actuarial job may very well move to what it should be. Actuaries should be spending their time doing the thinking and analytics and letting the machine do the processing work.

Actuaries need to keep up with new technologies and learn to employ them in their own jobs. So instead of being fearful of what AI might do in the future, actuaries need to consider learning about the technology and seeing how it can make their jobs more efficient. Quite possibly the role of the actuary in the future may include chief data integrity officers. ●

Betsy Wellington, FCAS, is a retired actuary and independent consultant.

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IN MY OPINION

What AI Will Mean for the Actuarial Community By MARIO DICARO

This essay is one of five essays that were submitted in response to the CAS Publications Department's call for essays on the "Intersection of Artificial Intelligence and Actuarial Science." See the CAS 2024 Summer E-Forum *for three other essays, including the prize-winning essay by Ronald Richman.*

Maybe you too have attended a meeting to work out with your colleagues the best way to structure the team's folders. Surely there must be a naming convention and structure that will finally result in things not getting lost. In that meeting, did someone point out that Microsoft and all other current file management systems allow you to use labels? You can categorize your files simultaneously in various hierarchies, rather than in just a one-folder structure. Digital files don't need to be put in a single bin or folder because they aren't physical objects. If you take the time to create meaningful labels, you'd just need to name your file and apply labels, rather than stress over exactly where to put it. That works well, but again, it relies on you and your colleagues to design and apply labels. The point of failure is, of course, the "you and your colleagues" part. So, with our advanced technology, what behavior have we adopted? Super-fast searching. Our computers index everything, and most of us use various search functions when needed, rather than putting much effort into organizing

anything very well beyond the project level.

Invention, innovation and a desire to make life incrementally better seem to be a basic drive of humanity. In ancient times, the innovations stayed localized and only moved between groups when those groups met up to trade, mingle or fight — very much like dolphins and other animals have localized foraging and hunting skills. Sometimes knowledge was lost when the person knowing the information died. Then came writing. Knowledge could be preserved across generations. Detailed instructions for making beer, recipes for tasty dishes and accounting of taxes and debts owed are some of the oldest recorded documents. Then came the printing press and innovations in all areas of life spread like wildfire. You've heard the story.

be made better by big inventions were ecstatic and talked of progress. Those whose jobs were being automated or politicians facing angry populations were anxious. As each society-changing invention was poked, prodded, improved upon, and finally used widely by society, the inventors, or usually the refiners, made huge profits, while those whose work was automated either mastered the new tools or were left to find other work. Were the inventions forced upon society? Mostly no, we chose to embrace them. Where's my proof? When was the last time you bought a hand-sewn dress or suit jacket? You still can; nobody is stopping you. There was a time before sewing machines, when fabrics were sewn together by hand to produce clothing. To buy clothes made that way today would cost you 25-100

Economists sometimes have predicted that people will spend less time working because of all the inventions. But that hasn't ever proven true.

AI is turning out to be as transformative as the printing press and the internet were. As far as innovations go, it's not even in the same ballpark as labeling folders.

Hopefully, you've read not just about other great inventions in history but about how well they were received. People whose lives were expected to

times[1] the cost of the item made with the help of machines. Embracing innovation is what changes the way we live collectively. It frees up the laborer's time and reduces costs for the consumer. Economists sometimes have predicted that people will spend less time working because of all the inventions. But that hasn't ever proven true. People find

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other employment, work just as much, and the benefit is passed to society in the form of new stuff to buy or the same stuff to buy at lower cost. Laborers of all sorts spend less time working because of social standards and regulations, not because their jobs were automated. People who don't like the new inventions have the option to live in societies that don't have those inventions. Where do you draw the line though? Even those living off the grid use Mason jars to store their herbs and copper wires to connect their solar cells to their LED light bulbs.

But now I'm rambling. Let me get back to the subject of what AI will mean for the actuarial community.

Let's start by defining some terms. Well, just one: AI. I won't add a footnote linking to the controversies around the words "Intelligence" and "Artificial." If you haven't already, please Google "What is AI" and immerse yourself in the ongoing effort to define human intelligence and what an artificial version would be. I'll define the term by distinguishing AI models from the models we've been building for 30+ years.

Actuaries have always designed and used models of various forms. When people talk about models in modern actuarial contexts, they are talking about models that require the use of computers — what is often called machine learning outside actuarial groups. Among actuaries, generalized linear models (GLMs) have been implemented for pricing since at least 1989. The pioneering work was done in unregulated

personal motor lines in the U.K. and Europe.

GLMs, decision trees and other machine learning approaches deliver to the analyst a model which has inputs and functions structured in such a way that the builder of the model can see and document exactly how a given output is calculated. In the context of pricing, you

can state which characteristics of the insured are determining the price that the model produces. A broad definition of AI would include those models. But that's not what people mean when they say "AI."

Whenever I hear people use the term "AI," they are referring to a computer program that does calculations resulting in capabilities that they previously thought only people had — things like identifying objects in pictures, correcting phrases, translating languages, making up stories and pictures, driving a car, carrying on a conversation or writing computer programs.

Most models that people refer to as AI are instances of what practitioners would call very large artificial neural networks, or just neural networks (NNs). The weird thing about NNs is that the engineers don't know quite what the

model is using to make its inferences. The engineers know how many layers and nodes there are, they know the weights assigned to the connections that came from the training process, they know what the utility bills are for running the servers and graphics cards, and they know what information was fed into the model. But there are billions of

Over meals, I've heard people a generation (or two) younger than me balk at the idea of brainwave reading devices and laugh at Neuralink's ambitions. But they are wrong.

nodes and weights. The model created by the training process is something that seems to reproduce some of what our own brains do, that is trained in kind of a similar way, and in the end, that seems to be just as hard to understand. That is what I'm going to call AI: any model that is built in such a way that its creators don't know exactly which inputs and functions lead to a given output.

The creators know how to set up the environment. They know how to kick off the training process. They know how to evaluate the accuracy of the model. To track exactly how the model comes up with any one of its inferences would probably require an even bigger and less scrutable model. All you can really state is what all the inputs are, then look at the output and decide whether you like it or not. That's what people mean when they say AI.

Using NNs researchers can build headbands today that convert electro-encephalogram (EEG) waves to text with 40% accuracy.[2] Today! With those headbands, we the analysts will be writing code and responding to messages by what will feel like tomorrow.

Over meals, I've heard people a generation (or two) younger than me balk at the idea of brainwave reading devices and laugh at Neuralink's ambitions. But they are wrong. Society will accept these communication devices with open arms. Just like we did with printed words, cars, light bulbs, machine guns, nuclear power, computers, the internet, YouTube, smartphones and Amazon. What makes "now" any different? People aren't different, and there are better safety protocols in place. I bet that as a percentage of the population, far fewer people will ever die from Elon Musk's Neuralink implants than died in automobile accidents during the first 10 years after the Model T hit the roads.

But how can actuaries use such tools? I'll address the three areas of work I have experience with: predictive analytics, capital modeling and reserving for non-life insurance lines.

Let's start with reserving work. There are two main branches of reserving work: claims (or case) reserving and actuarial reserving. These functions are performed somewhat separately by the claims departments and actuarial departments. And there's no need for me to try to summarize them – here's the ChatGPT summary:

Actuarial reserving refers to the work typically done by actuaries, which involves estimating the required reserves for the entire portfolio of insurance contracts to ensure the company can meet its future liabilities. This process often uses statistical models and historical data to predict future claim payouts.

Claims reserving, or case reserving, refers to the estimates set by claims adjusters for individual claims. These reserves are set based on the adjuster's assessment of the amount the insurance company will need to pay to settle each specific claim.

These generalized labels distinguish between the macro-level, statistical and model-based approach of actuaries (actuarial reserving) and the micro-level, individual claim-focused approach of claims adjusters (claims reserving or case reserving).

Claims adjusters are exposed to many individual cases and develop a detailed understanding of expenses and payouts associated with claims. Case reserve departments follow their own norms like any other corporate function. For example, on first notice, an adjuster will create a record in the claims system. The team may have a rule that you set a minimum case reserve of $1,000 to indicate the claim has been opened. Another rule may be to set the case reserve to $50,000 to indicate you expect legal action rather than a simple payout. Many companies already have models that estimate the ultimate payouts, models that update the initial estimates and models that prioritize claims likely to go to court. The ability of AI to read documents and understand images is already drastically changing workflows in this area. For example, some case reserves are set automatically by an AI based on images uploaded by the policyholder; that is, if the fraud detection AI doesn't flag the policyholder as a risk.

Case reserving workflow changes will continue as more and more models are trained on the various stages of the work. They will ingest and utilize internet data, legal information and cost trends, and they will interact more and more with vendors that insurers use for settling claims.

I think the areas of non-life actuarial reserving most likely to be impacted by AI have to do with data collection, workflow automation and document generation. I doubt that AI will be used to dramatically change the calculations performed for three main reasons.

1. **Lack of incentive.** Improving ultimate loss estimates by 1% does not have the same impact on profitability as improving pricing accuracy by 1%.

2. **Strong auditing and regulatory oversight.** Altering reserving methods increases audit and regulatory burdens, which is difficult to justify given the first issue.

3. **Executive involvement.** Automating reserve calculations reduces expert judgment and management flexibility.

Capital modeling is in the same boat as reserving. In capital modeling, you have exposure information at various levels of granularity and risk measures for nearly all categories of risks a company faces. Investment portfolios, natural catastrophe risk, cyber risk, price and wage inflation — it's a long list. It is the area I spent most of my career working in, and maybe that is why I struggle so much coming up with ways AI will

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2 https://www.uts.edu.au/news/tech-design/portable-non-invasive-mind-reading-ai-turns-thoughts-text

improve capital modeling-specific tasks.

Soon we'll have copilots helping us with everything we look at digitally. And soon after that, everything we look at will be converted into a digital representation so that our copilots can help us with the real world, too. Documentation, designing presentations, coding workflows, research and many other tasks that are part of capital modeling will be improved. But what about fitting probabilistic distributions to historical data, selecting correlation coefficients and designing risk tolerance statements? Maybe the copilot will be there to help remind actuaries that describing risk in terms of percentiles is far more effective than talking about standard deviations.

I'm sure there are ways we could use AI to improve Montecarlo sampling, though my imagination is hitting its limits on that one. A market constraint exists: How much money is in it? How much improvement can really be made? Those are the things that draw investment in innovation. If a new killer app for capital modeling shows up, it will be from a boutique startup run by an enterprising team of actuaries. And if it is successful, it will certainly attract the attention of larger firms.

That brings us to the last branch of actuarial work I'm going to write about in this essay: predictive analytics. As I pointed out earlier, the actuarial community has been applying computer-based predictive analytics in pricing since at least the late 1980s and early 1990s. The datasets have grown larger, and the complexity of the models has increased. One thing that's remained constant, though, is that the input variables used by the model to produce predictions are well-known and subject to regulatory oversight. There is typically

a logical link between the predictors and the target variable. With the advent of telematics, the predictors are more arguably cause-and-effect as opposed to correlative.

Why use a neural network to do something a GLM or decision tree is doing very well? In competitive environments, we don't introduce complexity

unnecessarily. I suspect that pricing and underwriting models will continue to be mostly based on GLMs and decision trees.

But everyone knows the modeling part is the easy, fun part of the job. The big lifting happens in building our datasets. And that is where the Large Language Models (LLM) and NNs will really shine. These tools are already giving us access to vast stores of features in documents that were very difficult to extract with older Natural Language Processing (NLP) strategies. Companies can see the value in structuring the storage of these documents and making them accessible to the modeling teams. Over the last 20 years, predictive analytics and data science skillsets have turned into full career paths. The same is happening with feature engineering, and that space will be strongly influenced by AI.

All those impacts I've described didn't address how AI will change the nature of the risks we insure. The world has steadily grown safer for people and more connected in trade and governance. At the individual insured level,

the amount of information garnered through AI interpretations of video, audio, GPS and various other sensors will continue to improve safety and reduce risk. This information will impact the work of predictive analytics and reserving. However, the interconnectedness of things will create opportunities for contagion that didn't exist previously.

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For example, at present my car's ability to navigate an intersection does not depend on the same cloud computing resources that my bank transfers do. Without some time of planning, they soon will. That tendency will impact the capital modeling teams and create more topics for them to research and model, just like it did with cyber risk and cyber insurance over the past 10 years.

These are my views on the intersection of AI and my corners of actuarial science – in the near term anyhow. Looking a bit further down the road, I'm certain we'll be hiring people who grew up using virtual reality headsets to play games and to interact with their friends. Those new recruits will be perfectly comfortable using immersive devices. In fact, they'll find it silly to use just a screen or even a keyboard. I'm sure I don't know all the ways AI will change actuarial work, but I'll love watching it develop and, hopefully, being part of it. ●

Mario DiCaro, FCAS, CERA, works for Tokio Marine HCC.

RANDOM SAMPLER

Advice from a Seasoned Actuary By PAT TEUFEL

The following is an excerpt from Pat Teufel's Address to New Members, given during the CAS Spring Meeting Business Session on Mary 6, 2024, in Atlanta.

I am deeply honored to have been asked to address you this morning … I sat in your seat as an Associate in 1975 and gained my Fellowship four years later in 1979 — before most of you were born and at a time when the actuarial exams were much easier.

I tried to recall who gave the Address to New Members at my Fellowship meeting. My mind drew a blank. I thought, must have been a typical actuarial speech — you know, the ones you fall asleep for? But I felt somewhat guilty; Why couldn't I remember who gave the Address to New Members? And then it dawned on me. This tradition, having a past president address new members, only began in 1985. It's relatively new in the span of our 100-year history. Whew! I was happy to hear that I had in fact passed the informal cognitive test in order to give this address.

… Why have an Address to New Members? I think that this is a way for the CAS to impart its culture and core values, in a personal way, as our organization grows larger and more diverse. It is also an opportunity for … me to share some of the lessons learned along the way … .

First, recognize that this is not the end, but a beginning. Leroy Simon, in his 1999 Address to New Members warned, "It is easier to become an actuary than to *be* one." I've certainly found that to be true. In preparing for today's remarks, I decided that I needed try something new; I embarked on the world of ChatGPT. I entered this thought: "Speech congratulating young professionals on the achievement of a professional milestone." In less than a minute, I received a proposed address. I didn't use that directly — it seemed a bit impersonal and I thought I could do better — but I did decide to incorporate some of the suggestions in my remarks today. We can use AI to our advantage — let's understand the risks but embrace the opportunity.

In reaching this actuarial designation, you have demonstrated excellence in the analysis of numerical data and a mastery of the key elements of casualty actuarial science. You have a firm understanding of what it takes to be a professional. With this foundation, you're now ready to turn things on their head and see them in a different light. Actuarial science continues to advance, and we must grow too. You have embarked on a lifetime of learning — from each other, from non-actuarial business colleagues, from family and friends. Some of this learning will be technical, although in areas not currently tested on the actuarial exams — perhaps nanotechnology, nutrition, behavioral science or weather. But the majority of your learning will likely fall in the area of "soft skills" — understanding how culture influences one's view of reality, how to communicate complex actuarial concepts to non-actuaries, how to influence decisions.

Second, expand your horizons and your experiences. Most of us spend the early days of our actuarial careers talking with other actuaries. Occasionally, we'll share moments with our significant others, maybe even our children — but often just to negotiate schedules. Now is your time to expand your horizons and listen — truly listen. You'll be amazed

With this foundation, you're now ready to turn things on their head and see them in a different light. Actuarial science continues to advance, and we must grow too.

at the perspectives you can gain from underwriters, claims adjusters, accountants, lawyers, marketing professionals — yes, even family! These new perspectives will prepare you for broader roles within your company, but also for richer lives. Be open to new opportunities. Yes, it's uncomfortable to venture into uncharted territory. "Will I be good enough?" "What if I fail?" Do it anyway! The rewards are plentiful, whether you succeed or bomb. Some of my richest learning experiences were those where I failed abysmally!

Third, time — there's never enough. Learn to manage your time well, on things that are important to *you*. Focus on *all* aspects of your life — work, fam-

and the strength to persevere ... There are myriad ways to pay it forward, through direct contributions to worthy causes, through mentoring and service activities, through service on any one of over 100 CAS committees and task forces, or just by being there — fully there — at the moment someone needs a shoulder to lean on.

Lastly, have fun along the way. If you are not happy doing what you're currently doing, make a change. We spend too much of our lives at work to have it be doing something you hate! Even if it means branching out from actuarial, there are thousands of ways that you can use the skills you've gained in meaningful ways. Invest your time in something you really love! Take time to laugh with friends and colleagues. I firmly believe that life is a journey of finding ourselves — the best that we are. Many people cross our path in that journey. Treasure each and every person, each and every moment.

... Find as much joy in this profession as I have. Who knows, 50 years from now ... perhaps it will be one of you who is tapped to give the Address to New Members! ... . ●

CAS Past President Pat Teufel shows off her array of ribbons at the 2024 CAS Spring Meeting in Atlanta.

ily, yourself. Balancing work and family commitments is an art, not a science. What works for me will not necessarily work for you. I urge you to make a conscious choice about the balance that you want in your life and what will work for you in achieving that balance.

In that balancing act, remember to pay it forward ... Whatever our personal struggles, we have been blessed with keen minds, strong education, a lucrative profession, the support of families

Pat Teufel, FCAS, MAAA, CAS President in 2012 and as Chairperson of the CAS Board of Directors in 2013, has been a CAS volunteer for over 50 years. Now retired, she was a leading principal at KPMG and later an adjunct professor at University of Connecticut for more than 10 years.

IT'S A PUZZLEMENT By JON EVANS

A Framed Circle

What is the area of the circle in the image to the right?

Hyperspace Ball and Cube

A 25-dimensional ball (a 25-ball) with radius 3 and a 25-dimensional hypercube with edge length 2 are concentric. What is the 25-dimensional volume of their intersection? Estimate with high confidence of at least three correct leading digits.

Steve Mildenhall provided the following simulation solution, using Python code generated with some help from Chat GPT.
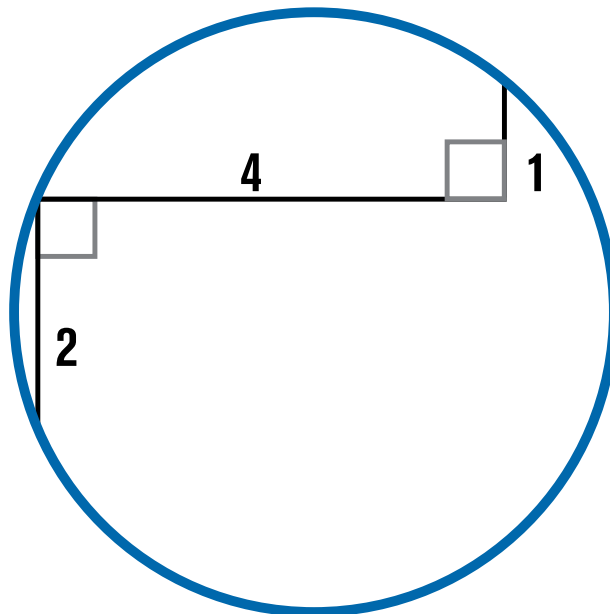
The three leading digits are 227.

The answer is approximately 22,742,709 or 68% of the volume of the sphere. Following is the Python code:

```python
from scipy.stats import qmc
import numpy as np

dimension = 25
radius = 3
radius2 = radius ** 2
side = 2
scale_factor = side / 2 # Scaling factor
    to adjust points from [0,1] to [-1,1]
step = 2 ** 20

def is_inside_ball(point):
    global radius2
    return np.sum(point**2) <=
        radius2

sampler = qmc.Sobol(d=dimension,
    scramble=False)
prev_volume = 0
converged = False
i = 0
V = side ** dimension

while not converged:
    i += step
    points = sampler.random(n=i)
    points = (points * 2 - 1) * scale_fac-
        tor # Scale points to fit the cube

    # inside_count = np.sum([is_in-
        side_ball(point) for point in
        points])
    inside_count = np.sum(np.ap-
        ply_along_axis(is_inside_ball,
        1, points))

    cube_volume = side ** dimension
    estimated_volume = (inside_
        count / len(points)) * cube_
        volume

    if i > 100000 and abs(estimated_
        volume - prev_volume) <
        0.001:
        converged = True
    else:
        prev_volume = estimated_volume
    print(f"Estimate after
        {len(points)} points: {estimat-
        ed_volume} {estimated_vol-
        ume / V:.5f}")

print(f"Final estimate: {estimated_vol-
    ume}")
```

Solutions were also submitted by Moshe Gelbwachs, Jacob Ogle and Anthony Salis. ●

Know the answer? Send your solution to ar@casact.org.

VALUED

At the CAS, we strive to be a valued and trusted resource for risk professionals, giving them unparalleled support as they develop professionally and advance their careers. Learn more about our premier educational resources and training for the global community of property and casualty experts at casact.org/valued.

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