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CAS ELECTION 2022

2022 CAS Spring Meeting Coverage

Competitions Cultivate New Generation of P&C Actuaries in China

July-August 2022

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departments

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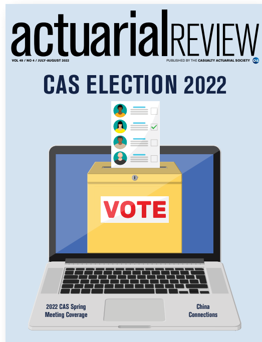

on the cover

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actuarialREVIEW
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editor's NOTE By ELIZABETH A. SMITH, *AR* MANAGING EDITOR

Be In The Know!

It's election time again, and our cover story introduces you briefly to the candidates running for spots on the CAS Board. However, there's even more information on the candidates' views, including video, on the CAS website, making it easier for you to make an informed vote. In the President's Message, Kathy Antonello writes of the board's mission and the importance of voting. The board will ultimately affect the direction of the organization, so watch and read to decide on your representatives.

Of this *AR*'s feature stories, Dale Porfilio, FCAS, covers sessions from the 2022 CAS Spring Meeting. Hot topics include the root causes and practical considerations for dealing with inflation for pricing, reserving and planning; using behavioral science to better communicate with leadership teams; and viewing the risks emerging around climate-related litigation through the lens of reinsurance.

In our other feature story, CAS Country Manager for China, Ran Guo, FCAS, writes about our efforts in that country to expand understanding and interest of the property-casualty insurance business. Students as well as statistics and insurance professionals competed in a series of data analysis competitions emphasizing P&C practice. One competitor noted the "charm" of analyzing insurance data, confirming what CAS members have known for a long time!

Ethical Issues is back with another scenario designed to stimulate discussion amongst *AR* readers. Let us know what you would do in this case dreamt up by the Professionalism Education Working Group by emailing ar@casact.org.

Finally, after several weeks of effort, *AR* welcomes the last of the group photos from the 2021 CAS Annual Meeting. This set of photos is of the CAS Fellows from 2020 and 2021 who were able to attend the 2021 meeting in San Diego last November. (Their ACAS counterparts were featured in May-June 2022 *AR*.) Delayed by the pandemic and the loss of some of the identification papers, the photo captions were verified with the tremendous help of the photos' subjects. I heartily thank these new CAS Associates and Fellows for their assistance. Let's all celebrate these fine professionals once again on their achievements!

Enjoy!

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.

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Voting — It Is Your Responsibility

It is election time for the CAS — an important time of the year when we have the power to elect the directors who will determine the future of our organization. This is a fundamental privilege for our voting members.

Each year, dedicated individuals step up to participate in the foremost volunteer effort our association offers: a three-year term on the CAS Board of Directors.

I am taking this opportunity to describe what the board's responsibilities are, but more importantly, what *your* responsibilities are as voting members — to be informed and to vote in this election.

Board role and composition

The position description of the CAS Board sets forth the purpose as follows: "Set policy; set strategic direction; establish, review and monitor long-term plans; and ensure that the appropriate financial and operational controls are in place." It goes on to state: "Within this framework: all operational and administrative aspects of operations are the province of the Executive Council." Note that the executive council includes the president, president-elect, the vice presidents and the CEO. The upcoming election will determine the president-elect and four new directors, who, along with the existing directors, are responsible for selecting the vice presidents and CEO. These are crucial charges, and it is vital that voting members make thoughtful choices on who should represent them on the board.

CAS members come from diverse backgrounds and represent many stages along the actuarial career path. Our membership includes newly minted actuaries, seasoned professionals, career changers and retirees, to name a few. We work for many different kinds of organizations — big consulting firms, small insurance companies, insurtechs and government. We pride ourselves on the wide variety of industries we serve. We take on numerous roles — from consultant to executive and from analyst to director. The 15 elected board members represent this wide-ranging composition of our membership.

Governance structure

Ours is a representative form of governance. Board members are elected to lead and make decisions that we feel are best for the organization. The members choose the board, which in turn represents the members in the important matters listed above. A notable exception is an amendment to the CAS Constitution, which requires an affirmative vote of 10% of the Fellows or two-thirds of the Fellows voting, whichever is greater.

Recently, in response to member feedback, the board has been more proactive about getting members' input on the strategic direction of the CAS. We know we can do better in this area and we are committed to continuing this practice in the future. While the CAS strives to achieve wide-ranging member input, it is not feasible to get input on every decision the board has to make. That's why board elections and voting for candidates that represent your viewpoint are so important!

Voting — who, what and how

CAS Fellows as well as Associates who have held their designations for five years or more are eligible to vote when online polling opens on August 1, 2022. This *AR* contains 100-word summaries written by the candidates. Even more information can be found on the CAS website's "Meet the Candidates" section (https://www.casact.org/about/leadership-and-staff/elections/meet-candidates), which includes responses to questions submitted by members. This election marks the third year that we have used videos to help inform your vote, and I have found these videos to be a useful tool that gives insight beyond what the candidates have written. Please take advantage of all the information the candidates have provided. It is time well-spent to educate yourself about our future directors.

There are many ways to select which candidates will receive your vote.

One is name recognition. Maybe you have worked at their companies or they went to your school. Perhaps you recognize their names from their contributions to *AR* or the CAS website. You might know them from the research papers that they have written. Maybe you've volunteered with them or have seen them present at a meeting or seminar. These elements are commonly considered when voters cast their ballots for the CAS Board of Directors.

Another is to understand what the candidates convey about the current and future direction of our organization. The "Meet the Candidates" section will help you determine how the candidates align with your vision for the future of the CAS. Some additional things to consider

President's Message, page 8


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President's Message

from page 6

include the following:

- Are they promoters of the status quo and the historical standing of the organization or are they agents of change?
- Do they see value in strengthening actuaries' positions in traditional roles?
- Are they focused on seeing actuaries progress in new areas?
- What could their working experiences bring to CAS governance?
- Gender, age, ethnic origin, business background, current employment status — do these items contribute to board diversity, and is that important to you?
- Are they supportive of the current strategic direction of the CAS or do they want to change that direction?
- Are they volunteers with strong institutional knowledge of the CAS or are they volunteers with innovative perspectives? Or are they a combination of both?

Again, think about what's important to you and where you want the CAS to go. This is your decision! The elected directors will ultimately represent you, and it's important that you determine the candidates who will best serve your vision for the CAS.

Thanks to our volunteers

CAS volunteers are the heart of the organization and serving as a volunteer director is a major commitment of time and talent to our membership. We certainly have a lot of intelligent members who are up to the task.

Vote!

Online voting opens on August 1, 2022, and closes on August 31, 2022. CAS members will be notified by email when voting begins.

Read the candidates' messages and view the videos available online to help you make the most informed decision possible. These leaders will shape the future of the organization, so take time to fully vet your decision. Learn all you can at the "Meet the Candidates" section, https://www.casact.org/about/leadership-and-staff/elections/meet-candidates.

I commend and thank all the candidates who stepped up to run for the board. Elected or not, they each have made a commitment to the CAS that is of the highest order.

Call to action

Over the years, the CAS has had an impressive number of voters participating — averaging 34% over the last 10 years. In the association world, this percentage is enviable, but we are not satisfied with that figure. We want voter turnout to be much, *much* higher.

I'd like to see that percentage rise considerably. Please help make this goal a reality.

The candidates you choose will speak for you. Choose them on how well they align with your vision, for the future of the CAS.

In short — inform yourself, and then go vote!

"Sense and Sensitivity"

Dear Editor:

I was disappointed by the continued push for "equity" in the March-April *AR*. The cover story asked if rates are "fair." Accidents and speeding tickets indicate poor driving, and charging more for them deters bad driving. However, only 78% and 75% of the respondents were willing to say that either is fair. Only 50% agreed that hard braking/sharp turning was fair. This approach may lead to charging everyone the same price — a clear contradiction to the ratemaking principles. Kyle Bartee's letter stated: "Since most of us believe the exam process to be unbiased, one has to conclude that there is a bias in the funnel." Bartee ignores other possible explanations, including the fact that some races are overrepresented in poor school districts. Even the "It's a Puzzlement" column, usually apolitical, is pushing for an "equitable pass curve" at the same time we are being assured that we don't need to worry about the CAS using multiple pass marks on our exams. This is all happen-

ACTUARIAL REVIEW *LETTERS POLICIES*

Letters to the editor may be sent to ar@casact.org or to the CAS Office address. Please include a telephone number with all letters. Actuarial Review *reserves the right to edit all letters for length and clarity and cannot assure the publication of any letter. Please limit letters to 250 words. Under special circumstances, writers may request anonymity, but no letter will be printed if the author's identity is unknown to the editors. Event announcements will not be printed.*

ing as the CAS just issued four poorly argued papers on "Race and Insurance Pricing" that all state that today's differences in outcome are due to past discrimination and must be corrected. I feel that the CAS's continued push for equal outcomes is putting all of the members in an awkward place, where it is difficult to charge actuarially sound rates. In this world, companies will compete on their marketing plans instead of their pricing plans as we've seen with U.K.'s drive-likeagirl.com.

—Joel Atkins, FCAS

Dear Editor:

Your March-April 2022 cover story discusses the fairness of predictive rating variables. It failed to discuss the fairness of variables used by certain companies used to predict the price elasticity of insurance. I moved to a fairly nice area of Arizona, only to be subject to multiple double-digit price increases by a few different companies upon renewal despite a very good driving record. Upon discussion with the pricing actuaries of some of those companies, I was told that the companies look at where I live, the cars I drive, then intuit that I probably have a good job and not a lot of time to investigate switching companies if I get a large rate increase. The company's models say I will likely tolerate a relatively large rate increase without shopping for new insurance. I know there has been discussion of this topic at some CAS meetings and have heard actuaries respond that "there is some tension between predictive models of elasticity and pricing laws," to another actuary saying that "they only come up with models, and the underwriters set the rates." The fact is that I consider such elasticity models to be in violation of insurance laws and actuarial principles of pricing, since what someone is willing to pay has no relation to that person's cost for the insurance companies. I suggest any company using such elasticity models reconsider their practices.

—Steve Visner, FCAS, MAAA

Sample Bias Discussion

Dear Editor:

Kyle Bartee's letter made technically questionable use of the phrase, "sample bias." In statistics, sample bias refers to non-representative sampling of a population. It can lead to misestimation of parameters. For example, the sample mean could be higher, on average, than the population mean. If you estimated the proportion of the U.S. population who like ice cream by polling patrons exiting the local ice cream parlor, you might get an overestimate due to sampling bias. However, when Bartee refers to sample bias, he is not discussing sampling at all. Rather his argument is that sample bias exists because the percentage of actuaries who are Black is lower than the percentage of Blacks in the overall U.S. population. But there is really no sampling involved, and hence no sampling bias. The technically accurate statistical statement is that the subpopulation of actuaries in the U.S. is not a random sample of the U.S. population. The same could be said about many occupations. Disproportional representation of various racial, ethnic and religious groups likely exists, but it does not prove or disprove any discriminatory bias was involved. Bartee's use of sample bias terminology confounds the statistical sense of the term with the charge he is implicitly making that there is racially discriminatory bias in the CAS credentialing process or in the funnel leading to it. This use of "sampling bias" is a misuse of statistical terminology.

—Ira Robbin, FCAS

Dear Editor:

The March-April *AR* published a flawed, illogical letter to the editor from Kyle Bartee. Even more unfortunate, that letter was given a prominent position. Bartee talks about "sample bias" in the CAS membership. He states: "... the CAS membership can be considered a sample of the population where members come from." He doesn't specify what this population is but refers to the CAS website, where I could not find anything dispositive. The infographics he refers to show the current membership, for certain demographic categories. This is not a population from which the membership has been sampled; it is the membership. There is no sampling. The common approach of DEI advocates is to use the total U.S. population as the basis for sampling — a seriously flawed approach for CAS membership. It ignores prerequisites (e.g., education, aptitude and interest) and performance requirements (e.g., gaining sufficient pertinent knowledge and demonstrating that knowledge by passing exams). The prerequisites alone will probably eliminate a large majority of the U.S. population, which is hugely unlikely to occur in exactly the same proportion of every possible demographic characteristic. The performance requirements (who is taking and passing exams) could be viewed in terms of demographic characteristics; these are also likely to depart from the U.S. population. In summary, Bartee's presentation is ambiguous, with weak logic and poor statistical analysis. The letter should be retracted.

—Robert Finger, FCAS

Kyle Bartee responds:

The CAS DE&I website has an imbedded video that shows the demographic distribution analysis (first video under "Highlights" section). I encourage you to watch the whole video, but the distributions are shown starting at 1m:35s and 5m:30s. Finger rightfully points out that comparing the demographics of the U.S. population to the CAS Membership does not consider prerequisite and performance requirements, but that point is explained with a comparison between the CAS Membership and U.S. Math Graduates (source: National Center for Education Statistics). While not perfect, using the math graduate demographics help control for the prerequisite and performance requirements. Since underrepresentation of minority groups in the CAS membership is more significant than that of math graduates, it implies that the CAS is losing out on potential talent that would otherwise enter the actuarial pipeline. Filling that talent gap is the whole purpose of the CAS DE&I initiatives, and it is being achieved by increasing awareness of our profession with the underrepresented groups and removing financial barriers for potential candidates with no other means of reimbursement. Those initiatives come from the Barriers to Entry study. I don't see anything wrong with increasing awareness among groups that have never heard of an actuary because the goal of improving diversity has been a CAS goal for decades and aligns with what employers are seeking. Lastly, if the CAS is going to spend resources achieving that long-standing goal, they should also measure their successfulness, making sure those resources aren't being wasted.

COMINGS AND GOINGS

Steve Math, FCAS, has been promoted to president and CEO of Specialty Comp Insurance Solutions (SCIS). Math joined SCIS in 2019 as executive vice president and chief underwriting officer, bringing over 35 years of experience in the industry.

Denise Olson, FCAS, has been promoted to head of programs for Zurich North America. Olson oversees Zurich's programs business and fostering and maintaining relationships with program administrators. She joined Zurich in 2003 and was most recently the technical director for programs.

Joseph Gravelle, FCAS, has been promoted to actuarial assistant vice president–insurance analytics for Mutual Benefit Group. He is tasked with development and maintenance of P&C insurance products with shared responsibility for growth and profitability. Gravelle came to Mutual Benefit Group in 2020 as the tactical pricing and product manager.

Jon Bloom, FCAS, has been promoted to senior vice president, personal products for ERIE Insurance. Bloom was most recently ERIE's vice president of personal auto. In his 19 years at the company, Bloom has held several other positions, including finance business partner for personal lines.

Jonathan D. Adkisson, FCAS, has been elected president and CEO of California Casualty Management Company. He will run the operations of the reciprocal California Casualty Indemnity Exchange (CCIE) as CEO of its attorney-in-fact, and he will serve as president of CCIE's four insurance company subsidiaries, together known as the California Casualty Group.

David Harris, FCAS, has been appointed senior vice president, chief reserving actuary at Everest Re Group. Harris will lead Everest's global reserving strategy, aligning the company's disciplined pricing, reserving and underwriting functions with its long-term objectives.

Patrick Charles, FCAS, has been promoted to global head of P&C insurance & services for SiriusPoint. He was previously head of Americas P&C Insurance. Charles joined SiriusPoint in 2021 from Zurich Insurance Group, where he held North American leadership roles in underwriting and strategy spanning the past decade.

Jing Gong, FCAS, has been appointed senior vice president, chief agent of Canada for Toa Re America. Gong will be responsible for setting the strategic direction for the Canadian business, and building upon Toa Re's success. He will seek opportunities to profitably grow the business. He will manage the relationship with OSFI and ensure that Toa Re remains in good standing, is satisfying all regulatory reporting requirements and will ensure that all appropriate controls are in place.

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

See real-time news on our social media channels. Follow us on Twitter, Facebook, Instagram and LinkedIn to stay in the know!

Executive and Admissions Teams' Additions Support CAS Strategic Goals

The Casualty Actuarial Society added two new staff members to support the CAS's important mission to educate property-casualty actuaries and help realize the organization's bold envisioned future.

Joyce Warner, CAE, has joined the organization as the CAS's chief business officer. Warner will work with the CAS Executive team to help plan and execute critical organization projects, while overseeing corporate relations, strategic affiliations and the CAS International division.

Margaret Lyons is the CAS director of certification development. Lyons will envision, lead, plan and manage the credential development lifecycle that contributes to enhancing the value of the examinations in the CAS Admissions Program.

An executive with over 20 years of organizational leadership experience, Warner most recently served as executive director of The Federal Employee Education and Assistance Fund (FEEA), a national 501(c)3 nonprofit organization, and president of FEEA's for-profit subsidiary, FEEA Childcare Services, Inc. She previously served as senior vice president and chief of staff of IREX, a global development and education organization, and as deputy director of the U.S.-Ukraine Foundation's Community Partnerships Project. Warner is a Certified Association Executive (CAE) and Senior Professional in Human Resources (SPHR) who holds a bachelor's degree from SUNY at Stony Brook, a master's degree from American University and a master's in business administration from

Joyce Warner, CAE

Margaret Lyons, ICE

Virginia Tech.

Lyons is a global credentialing leader with experience in credential development. She most recently served as program manager of continuous certification at the American Board of Foot and Ankle Surgery, where she designed and implemented their longitudinal assessment program. Prior to this role, Lyons held various positions at the Project Management Institute, where she helped manage and advance the development of the company's largest credential examination and agile certification examination suite. Lyons is a Certified Credentialing Professional from the Institute for Credentialing Excellence (ICE) and holds a bachelor's degree from Arcadia University.

"We are excited to welcome both Joyce and Maggie to our team here at CAS," said CEO Victor Carter-Bey. "Their notable expertise will directly support our work in achieving our CAS envisioned future and strategic plan, which includes a commitment to building skills of the future, expanding globally and increasing capabilities within the organization. Our 9,500 members — as well as the thousands of future members in our pipeline — will benefit enormously from their talent as we continue in our mission to serve as a valued partner for today's P&C actuaries and their employers."

CALENDAR OF EVENTS

August 3, 2022
CAS Trunk Show
Virtual

August 10-11, 2022
Crash Course in Vehicle Technology & Driverless Cars
Insurance Institute for Highway Safety (IIHS)
Ruckersville, VA

September 19–21, 2022
Casualty Loss Reserve Seminar
Marriott St. Louis Grand
St. Louis, Missouri

October 13, 2022
In Focus Seminar
Virtual

November 6–9, 2022
Annual Meeting
Hilton Minneapolis
Minneapolis, Minnesota

December 2, 2022
CAS Road Show
The Linq Hotel & Casino
Las Vegas, NV

Visit casact.org for updates on meeting locations.

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 Lifelong Chicagoan

James E. Gillespie Sr. (FCAS 1964)
1932-2022

James E. Gillespie Sr., a lifelong northside Chicagoan, died at the age of 89 in early January 2022. Born July 29, 1932, in the Windy City to John, an Irish immigrant and Chicago police officer, and Anne (Hayes) Gillespie, he attended Saint Edward Grammar School, Saint Patrick High School and the University of Illinois' Navy Pier and Champaign campuses. Gillespie was a true, diehard Chicago Cubs and Illinois Fighting Illini fan as well. His 40-year actuarial career included positions at CNA Insurance, Montgomery Ward Signature Group and Zurich America, where he officially retired as vice president. He was the beloved husband of Josephine (McManamon) for 65 years. He is survived by her along with their children, James Jr. (Carol), Thomas (Debbie), Mary Ann (Timothy) Nolan, Patrick (Rose Anne), John (Rebecca), Daniel (Krista) and Michael (Katie), along with 17 grandchildren, 13 great grandchildren, nieces, nephews, cousins and great friends. In lieu of flowers, please send donations to the Juvenile Diabetes Research Foundation, St. Jude Children's Research Hospital, Lurie Children's Hospital or GiGi's Playhouse. A video tribute is available at https://www.youtube.com/watch?v=YszBy_Ajd6Q.

A Life Cut Short

Frederick Oliver Larson (FCAS 2017)
1989-2021

Frederick Oliver Larson was devoted to becoming an actuary. He reportedly passed all 11 CAS exams on his first attempt. On December 26, 2021, he suddenly and unexpectedly died. He was just 32 years old. He was born December 14, 1989, to Gary and Melody (Luisi) Larson and attended LaGrange Highlands District 106 schools and Lyons Township High School in suburban Chicago. In 2012 he graduated with honors from Drake University in Des Moines with a bachelor's degree in actuarial science. While attending Drake, he was president of the university's actuarial student society. His career began at Willis Towers Watson (now WTW) in London. After becoming a CAS Fellow in 2017, he worked for American Modern Insurance Group and Munich Re before accepting a job with Ryan Specialty Group in 2018. He loved playing baseball and participated in an adult baseball league while living in Cincinnati. He was also passionate about politics, the Chicago White Sox and the Drake Bulldogs. His parents and brother Alexander survive him along with aunts, uncles, cousins, friends and colleagues.

The True Girl Scout

Christy B. Olson (FCAS 2001)
1970-2022

Surrounded by her loving family, Christy Olson passed away peacefully on February 9, 2022, after a short battle with cancer. As a model of the Girl Scout promise to help people at all times, she was a Girl Scout Gold Award recipient who stood up for her beliefs and for those whom she felt deserved a shot, especially women and people who didn't look like her. In 2018 she was named mentor of the year by the International Association of Black Actuaries. She also served other organizations and as a mentor/advisor/budget coach to disadvantaged women in Connecticut. An outdoors enthusiast, she was always up for a hike, a bike ride, a walk with friends, a lake/river paddle, skiing or yoga as well as watching her boys' baseball games. Besides being a great cook, she was a foodie who loved sitting by a fire with a glass of wine. She was born January 2, 1970, in Plainfield, New Jersey. After graduating from Boston University in 1992 with a bachelor's degree in mathematics, she worked for 29 years at Travelers Insurance. Her last position was vice president of business insurance loss analytics & reserving at the insurer's Hartford, Connecticut, office. The beloved wife of Adam B. Olson, she is survived by her sons, Matthew, Tyler and Carter; her parents, Norm and Myra (Levinson) Schreck; sisters; in-laws and other family and friends. In lieu of flowers, please consider donations to

Healing Meals (healingmeals-project.org), Gifts of Love (giftsoflove.com), Farmington Valley Trails Council (fchtrail.org) or the Jimmy V Foundation (v.org). To send online condolences to the family, please visit www.ahernfuneralhome.com.

The Passionate Actuary

Donald F. Mango
(FCAS 1984, CERA 2014)
1963–2022

Donald F. Mango died on April 8, 2022, surrounded by his family at home after sustaining a quickly moving cancer. He was 58 years old. A man of passion, he loved fiercely. He cooked dinners, planned date nights for his beloved wife, Patricia, recorded violin recitals, cheated on game nights, laughed at parties, screamed at theme parks and cheered at swim meets. He trained for triathlons and rowing competitions and chased down prize catches on deep-sea sharking expeditions and even more prized catches in the dribbling creek behind his home in Gladstone, New Jersey. He was also passionate about the actuarial profession. In 2019 he was awarded the CAS's lifetime achievement award for volunteerism, the Matthew Rodermund Memorial Service Award. Besides serving on the CAS Board of Directors and in other capacities, he won many CAS awards for his actuarial research. He was also a prolific author and entertaining speaker. Most recently, he was senior vice president, chief actuary and chief risk officer at Everest Reinsurance Company and an adjunct lecturer in actuarial science at Columbia University's School of Professional Studies. Born on October 24, 1963, in San Francisco and raised in Houston, he graduated cum laude from Rice University in 1985 with a bachelor's degree in mechanical engineering. A year later, he stumbled upon an actuarial assistant job listing and applied on a whim. Through this impulsive decision, he met his wife. The couple has a son, Alexander. Both survive him as do his family members, friends and colleagues. Donations can be made to The Actuarial Foundation's Actuarial Diversity Scholarship Program at www.actuarialfoundation.org/remembering-don-mango.

A Lively Curiosity

Robert P. Irvan (FCAS 1978)
1937-2021

Bob Irvan of Eatonton, Georgia, died at his home on July 6, 2021, surrounded by family. He was 83. He initially dropped out of college but, after 90 days working on an assembly line, decided to return to school and got a degree at Wayne State University. He worked for many years at CNA in the life and health field, and he earned an MBA from the University of Chicago. Irvan then joined AFIA, a consortium of U.S.-based companies formed to write insurance outside of North America. He was hired as their accident and health actuary, but began taking CAS exams as he got more involved in AFIA's P&C business. In 1978 he joined a small group of actuaries who held both FSA and FCAS credentials. CIGNA acquired AFIA in 1983, and Irvan was eventually named CFO. He frequently visited AFIA's (and later CIGNA's) foreign offices, especially London, which originated a large portfolio of reinsurance business. (Irvan observed, "The London market does not assume risk. It handles it.") He had a lively curiosity about many subjects. One of his favorite books was An Exaltation of Larks, an illustrated book of collective nouns. He traveled widely and loved trying local foods and beers. He is survived by Nancy, his wife of 54 years; his sons, Joshua and Jeffrey and their wives; and two granddaughters. Donations may be made in his name to the Robert and Nancy Irvan endowed Scholarship in Math at Wayne State University, Box 674603, Detroit, Michigan 48267.

IN MEMORIAM

John P. Booher (ACAS 1992)
1946-2021

NEW FELLOWS ADMITTED IN 2020 & 2021

Row 1, left to right: *Christina Doran, Jared Hageny,* ***2021 CAS President Jessica Leong, 2020 CAS President Steven Armstrong****, Abby Taylor Pearlman, Benjamin M. Britzius.*
Row 2, left to right: *Brian DeGeorge, Matthew Murray, Unidentified FCAS, Gregory W. Fears Jr., Courtney Mutch.*
Row 3, left to right: *Bryce Fabian Peterson, Joseph Schmitt, Mitchell Morris, Karin G. De Angelis, Scott Johnson.*

Row 1, left to right: *Michelle Lam, Allison Hill,* ***2021 CAS President Jessica Leong, 2020 CAS President Steven Armstrong****, Christina Dussault, Kimberly M. Miller.*
Row 2, left to right: *Jacob Brouillette, Jonathan Macenski, Andrea Everling, Justin Conlon, Patrick Goodney, Andrew Provines, Hyun Jin Park.*
Row 3, left to right: *Nicholas Crugnale, Blake Stein, Clarke Bjarnason, James Bengston, Joseph Blandford, Shuo Deng.*

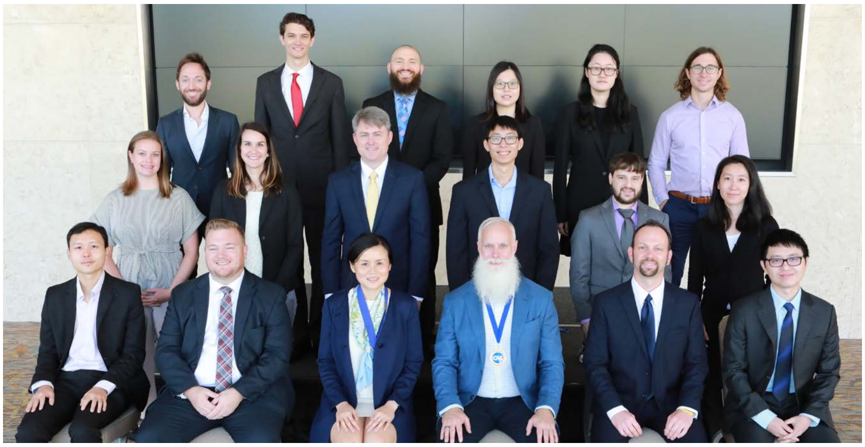
Row 1, left to right: *Kaitlyn Sutter-Murphy, Mary Reading,* ***2021 CAS President Jessica Leong, 2020 CAS President Steven Armstrong****, Rehan Siddique, Yinpok Robert Lee.*
Row 2, left to right: *Griffin Rock, Michael Murphy, Kirsten Soucek, Saiying He, Brent Taub, Nicholas Boguszewski.*
Row 3, left to right: *Adam Carvalho, Margo MacKenzie, Jessica Vanatta, Marisa Ravagnani, Heather Kanzlemar, Arun C. Madappat, Brian Wiest.*

Row 1, left to right: *Lauren Fisher, Kristen Fox-Neff,* ***2021 CAS President Jessica Leong, 2020 CAS President Steven Armstrong****, Sky Wong, Sumaali Chheda.*
Row 2, left to right: *Moriah Hield, Jessica Lehr, Nathaniel Schmitt, Max Unger, Tianxiang Yuan, Ting Xia, N. Ryan Karel.*
Row 3, left to right: *Miles Espitia, Eric Dynda, Roy Frank Drusky, Enbo Jiang, Alexander Beall, Luke Brandon Wolmer.*

NEW FELLOWS ADMITTED IN 2020 & 2021

Row 1, left to right: *Brendan Lee, Adrian Rowland,* ***2021 CAS President Jessica Leong, 2020 CAS President Steven Armstrong****, Cherie Dill, Mitchell Tencer.*
Row 2, left to right: *Yaxue Zeng, Chloe Marshinski, Erica Palm, Evan Saline, Nassim Benchabane, Brian Gorzkowski, Chad Conrad, Xiang (Shawn) Wang.*
Row 3, left to right: *John N. Wright, Tyler Eberly, Ryan Peiffer, James Frederick Hutchins, Andrew Piscano, Alexander Perhac.*

Row 1, left to right: *Michael M. Hall, Jerry Wang,* ***2021 CAS President Jessica Leong, 2020 CAS President Steven Armstrong****, Drew Ellerbrock, Tina Warnecke.*
Row 2, left to right: *Eliezer Lesser, Ryan Heyse, Cindy (Xu) Chen, Stephanie Lerner, Anne Gross, Winnie Reynolds, Christina Kyllo, Neal Kalinsky.*
Row 3, left to right: *Doug McKean, Andrew M. Dryden, Trevor Franda, Cody DePersia, Thomas Basile, Tyler Muehlbauer, Mikalai Filon.*



Row 1, left to right: *P.J. Lee, Alexander James Martin,* ***2021 CAS President Jessica Leong, 2020 CAS President Steven Armstrong****, Dustin Hevener, Bingfeng Xu.*
Row 2, left to right: *Heather Lhyne, Sydney McIndoo, Robert Stewart, Andrew Lin, Ken Clancy, Jenny Tam.*
Row 3, left to right: *Jedd Lob, Mark Roshak, Justin Luke Mast, Xiaotong Hou, Maoying Huang, Stephen Jacobs.*

Row 1, left to right: *Joyce Li, Kenneth S. Hsu,* ***2021 CAS President Jessica Leong, 2020 CAS President Steven Armstrong****, Jasmine Zhang, Unidentified FCAS.*
Row 2, left to right: *Nick Garvin, Amanda Glish, Alex Xiao, Yuanshen (Charles) Xu, Claude F. Faan, Keqin Lu, Raam Hariharan.*

NEW FELLOWS ADMITTED IN 2020 & 2021

New 2020/2021 Fellows not shown: *Josh Adler, Claudio E. Aguirre Lemus, Salmaan Karim Allibhai, Nickolas Alexander Alvarado, Faizan Amlani, Erick Emmanuel Arnaldo Ocadiz, Gloria Asare, John Kyung Jin Bae, Andrew Joseph Baglini, Pauline Lincong Bao, Joseph Michael Barnec, Alycia Morgan Barron, Michael Anton Baznik, Marc-Antoine Beaulieu Gagne, Michael Bedard, Genevieve Belanger, Joel Abram Belliveau, Jeffrey Daniel Berglund, Mary Katherine Bernard, Ronald Louie Bertrand, Neil William Biegalle, Conner A. Billings, Mihaela Boboc, Phillip David Briggs, Andrew David Brouillette, Laurel Sara Brown, Erin Nicole Bruggeman, Joel Bruxvoort, Jamie Coleen Byall, Si Hao Cao, Douglas Charles Carey, Justin Jacob Caruso, Justin Jacob Caruso, Paul Chang Hoon Chae, Daniel Chammas, Wilfred Wai Nan Chan, Chi Yu Chan, Heidy Shuyu Chang, Won Keun Chang, Xi Chen, Tingjiao Chen, Sara Chen, Xu Chen, Xiaohua Cheng, Iengieng Cheng, Rishabh Chhabra, Amos Huiqin Chiam, Ryan Li Mow Ching, Yi-Hsuan (Amanda) Chou, Hay-Tung Emily Chow, Herman Chow, Margret Hae-Jin Chung, Timothy W. Clark, Brendan Keith Coker, Anthony Colangeli, Sean M. Collison, Sergio Cornejo Jr., Molly Catherine Covill, Samuel Cyr-McNeil, Sharon Dominica D'Costa, Justin Dagenais, Hien (Haley) Bao Dang, Andy Dao, Marco Dattilo, Christopher E. Davey, Brian Earl Davis, John Franco Dawdy,Patrick Desjardins, Andrew John DiFronzo Jr., Marisa Anne DiMare, Sarha Dionne, Andrew Thomas Doidge, Paul Michael Donnelly, Jordan Donohue, Donald W. Doty, Jeremy Burke Doyle, Jeffrey C. Dozier, Boya Du, Thomas Michael Dukatz, François Dumont, David Alexander Dunlap, Charles Dupuis, Jeffrey David Durham, Shimon Yaakov Epstein, Catherine Rose Erdelyi, Tanya Ellie Eshel, Yaël Even-Fournet, Yinglu Fan, Kathryn Ann Fargnoli, Thomas Patrick Fiorillo, Zachary Andrew Fischer, Robert M. Fogelson, Le May Foo, Jean Forest, Paige Elizabeth Fox, Jon R. Fredrickson, Kaitlyn Amber Freeman, Blair Kathleen Freeman, Bethany D. Galley, Shi Yin Gao, Fabiano Garofalo, Jing Ge, Ethan Bradley Genteman, Andres Ruediger Gentzen, Steven M Getselevich, Danielle Marie Gilmour, Suhyeon Gim, Matthew Paul Gliebe, Felix Go, Julie Godbout, Lief Ian Godlin, Jing Wei Goh, Robert Allen Golightly, Homero Gongora, Justin Kyle Greene, Sandeep Singh Grewal, Jonathan Brian Griglack, Wenyan Gu, Isabelle Guérard, Colleen Michelle Gunsaulus, Robert Matthew Hager, Sean N. Hannah, Jeffrey Peter Hanschmann, Fei Hao, Andrew A. Harder, Tanner Jon Harrie, Zixing He, Tingyu He, Lingyi He, Mark Andrew Hebert, Christopher William Hecht, Kieran N. Hendrickson-Gracie, Joseph Robert Henton, Kevin Heroux-Prescott, Jessica Danielle Hildebrandt, Tobie-Eloi B. Hinse-Pare, Peter M. Hohman, Yipeng Hong, Yun Hong, Geng Song (Gibson) Huang, Jeffrey B. Huang, Scott Thomas Huisinga, John D. Irving, Jonathan Jacques, Kurt Jager, Peter Lawrence Jakes, Logan Joseph Jaklin, Alexandre Jean-Venne, Isabel Jiayi Ji, Fanbo Ji, Bin (Chris) Jiang, Shaocheng Jiang, Hao Jiang, Yu Jin, Jennifer Michelle Johnson, Nathan G. Johnson, Simon Jones, Nathan Wooyung Joo, Stephanie Marie Kalina, So Won Kang, Jason Matthew Kass, Zachary E. Kassmeyer, James Kaufmann, William James Kelley, Soon Cheol Kim, Gregory S. Kim, Kelly Alexis Kirker, Anton M. Klemme, Conner D. Knox, Mary Ann Korch, Paul Kory, Benjamin C. Kraus, Irina Kretskaia, Diana Krulevich, Kean Weng Kuan, Daniel Anthony Lack, Sz-Fan Lai, Sze Qi Lai, Keith Lam, Charles Lamarche, Ryan Andrew Landers, Michael Christopher Lange, Jeffrey Teixeira Lanza, Hio Lam Lao, Andrea Anais Magalie Lapras, Guillaume Larouche, Cheuk Yin Lau, Kenneth Yin-Hei Lau, Jonathan James Laubinger, Colleen Ann Laughlin, Jean-Philippe Le Cavalier, Audrey-Anne LeBlanc, Poh Kheng Lee, Heesun Lee, Jaison Lehoux, Jasmine Lemay-Dagenais, James D. Lentivech, Patrick T. Lesiewicz, Jimmy Levesque, Andrew Li, Ao Li, Chenxin Li, Hongjun Li, Joyce Li, Weilin Will Li, Xinxing Li, Chen Liang, Hai Qi Liang, Rutong (Vicky) Liang, Moriah Danielle Librun-Sawyer, Joshua Michael Lieberg, Lay Choo Lim, Jerald Jing Kai Lim, Anqi Liu, Ziqing Liu, Lijiao Liu, Yun-An Liu, Diana Teng Liu, Jedd Isaac Lob, Victor Daniel Lopez, Yinru Lu, Zachary Ryan Luety, Austin Conner Lynch, Thanh Ngoc Mai, Kathryn McKinnon Magruder, Anthony J. Maley, Justin R. Malmgren, Austin Silangil Mancenido, Sarah Manuel, Jake Andrew Marshall, Dylan E. Martz, Jacqueline Nyokabi Mathenge, Scott Andrew Lorne McGorman, Sydney Lucille McIndoo, Rachel N. McNutt, Ying Meng, Xingyi Meng, Francisco Meraz, Anthony Methe, Philippe Meunier, Qianhui Miao, Rachel Katherine Miccolis, Lhea Mio-Giroux, Raphael Milot, Austin R. Mitchell, Shaoxuan Mo, Amarpreet Kaur Modha, Jeffrey Allan Molgano, Mark H. Mondello, Alexandre Monette-Pagny, Chiho Moon, Daniel Z. Moore, Isabelle Morency, Melinda Sue Moss, Yue Mu, Tyler Christopher Munro, William Naftali, Norberto Namkoong, Danielle Nantais, Christina Lyn Negley, Li Yuan Ng, Ngoc Tuyet Nguyen, Nancy Ngoc Nguyen, Carri Nicodemo, Vanessa A. Nortz, Marni Jordyn Novack, Christina C. Oda, Cherity A. Ostapowich, Charles L. Page, Ryan William Paluszek, Jun An Pang, Michael Vincent Paradiso, Udit Pareek, Alexandre Parent, Young Kyu Park, Zdravko A. Paskalev, Roberto Jose Perez, Mitchell Curtis Peterson, Anh Q. Pham, Kyle David Poirier, Alice Popova, Boden James Pradel, Prem Prakash, William Joseph Prucknic, Yiannis Psiloyenis, William Thomas Purvis, Tao Qi, Xiao Qiang, Xuan Qin, Poppy Joanne Quinn, Erik Quiñonez, Raymond Anthony Rabel, Misha S. Rajcoomar, Francis Crevier Raymond, Neil William Redpath, Renee Richard, Daniel Duane Richard, Maxime Richer, James Riley, Alexander James Robinson, Courtney Elaine Codding Rohde, Thomas Roltgen, Blair Rose, Jia Qi Ruan, Sima Ruparelia, Kristin Nicole Ryan, Maura Ann Ryan, Avi Louis Saper, Nehal S. Sapre, Aaron Mark Sass, Shruti Saxena, Marie Angelique Scaglione, Trevor John Schaap, Michael J. Schleis, Elizabeth Rose Schmitt, Nicholas Michael Schneider, Matthew Charles Schreckenberger, Katherine E. Schwartz, Paras Sehdev, Kevin Shao, Ravi James Sharma, Andrea Yiyun Shen, Tiffany Tan Shi En, Laurie Elizabeth Shih, Edward Shin, Abhishek Shrivastava, Semen Sidorenko, Dallas Ryan Simons, Tavpraneet Singh, Robert Lewis Skrabal, Winnie Purcell Sloan, Brandon S. Smith, Eric T. Smith, Michelle Marie Smith, Kyle Alexander Smith, Yang Song, Mew Yeong Soo, Kirsten Nicole Soucek, Ian Michael Spafford, Anthony Michael Stachowski, Nicholas M. Stanford, Christine Stefanello, Zekai Sun, Alexander Weihrich Svoboda, Andrew B. Switzer, Rebecca Liangyun Sze, Michelle Tam, Chee-Hou Tan, Christine Sze Ting Tan, Yuan Tao, Jean-Philippe Tardif, Joseph Patrick Testa, Brandon Thorne, Kyla Thurnheer, Graham Scott Tibbets, Robert Tiger, Angjela Tiko, Michelle Ting, Aaron E. Ting, Promise Tober, Kevin Thomas Town, Benjamin James Train, Albert Tran, Yoyo Tsai, Siyu Tu, Benjamin Joel Tucker, Daniel Stephane Turenne, Alex Benjamin Twist, Geoffrey Udell, Stephanie Faye Uibel, Dhimal Vagh, Tiffany Cabrera Valdecantos, William Craig Van Alsten, Matthew Van Hala, Julia Vul, Andrew John Wagner, William Terrance Wakefield, Yu Meng Wang, Stanley Wang, Lawrence Wang, Zhiwei Wang, Jonathan Leo Wang, Huijun Wang, Daniel Michael Ward, Brett L. Ware, Tina L. Warnecke, Raychel Claire Watters, Alyson Jean Weber, Jacqueline Nicole Weiss, Alyssa Michelle Westfall, Emma Rose Wieduwilt, Brycin Quinton Wong, Kai Lok Fernando Wong, Chun Wang Wong, Kenneth H. Woo, Kayla Wood, Yichen Wu, Emily Wu, Chase Allen Wurdeman, Zilu Peter Xia, Dawei Xiao, Yao Xiao, Xiaoxiao Xie, Jiabin Xu, Rui (Ryan) Xu, Siqi Xu, Wang Xu, Zifan (Nancy) Yang, Bruce H. Yang, Gang Yang, Taylor Nichole Yeaton, Jasmine Jia Wen Yeo, Jonathan HC Yiu, George You, Shaoran Yu, Lina Yu, Wei Yu, Yizhi Yu, Yitao Yuan, Tianxiang Yuan, Micah James Zart, Kevin Raymond Zech, Corey Zeutzius, Di Zhang, Jerry Zhang, Likang Zhang, Shuo Zhang, Ya Zhang, Yechao Zhang, Ying Zhang, Yu Zhang, Yuchi Zhang, Yujia Zhang, Zinan Zhang, Chuoxiang Zhao, Yuan Zhao, David Cheng Zheng, Minjian Zhou, Peipei Zhou, Yuyang Zhu, Yuanshen Zhu.*

CAS STAFF SPOTLIGHT

Meet Yaroslava Jordan, CAS Accounting and Operations Manager

Yaroslava Jordan

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

- **What do you do at the CAS?**
  I oversee day-to-day financial operations and manage the accounting function of the CAS. I lead the operational planning and budget development process; produce and analyze financial reports that help leadership make informed business decisions; facilitate the annual financial audit; and monitor cash flows and investments.
- **What inspires you in your job? What do you most love about your job?**
  My role touches on every aspect of the Society, which allows me to work with teams across all departments, explaining the story behind numbers, helping find solutions to business questions. Besides that, I enjoy working with a dedicated group of volunteers on the Finance Council, Investment Council, Audit Committee and Risk Management Committee from whom I learn a lot.
- **Describe your educational and professional background.**
  I earned my BS in finance from George Mason University. Prior to joining CAS, I was a finance manager at the American Health Law Association, an educational organization devoted to legal issues in the health care field.
- **What is your favorite hobby outside of work?**
  I love spending time outside with my husband and 3-year-old son. I also enjoy exploring new places, cooking delicious meals, catching up with friends or recharging with a book.
- **If you could visit any place in the world, where would you go and why?**
  I love traveling and exploring new destinations, so normally it would be somewhere new that I haven't visited before — places such as Peru, which I planned to visit, but the pandemic got in the way. However, now, the one place I would want to visit the most is my home country Ukraine. I cannot wait for the senseless war to be over, so I can pay a visit.
- **What would your colleagues find surprising about you?**
  I have a bachelor's degree from a university in Ukraine, and my first profession was an English teacher, although I mostly gained it to learn English.
- **How would your friends and family describe you?**
  I polled my friends and family to get these answers: outgoing, kind-hearted, driven, great listener, adventurous, foodie and Ukraine patriot.

The CAS Celebrates the Finnish Actuarial Association's Centennial

On April 21, 1922, in Helsinki, the Finnish Actuarial Association (FAA or *Suomen Aktuaariyhdistys* in Finnish) convened its very first meeting. The FAA celebrated their 100-year anniversary on April 28, 2022, by hosting a seminar and a dinner in downtown Helsinki. CAS International Member Services Task Force representative for Scandinavia, Robert B. Anderson, FCAS, had the opportunity to attend the event and meet with FAA President Annina Pientinalho and Vice President Harri Kuosmanen.

Over its history, the FAA has contributed greatly to the advancement of actuarial science, particularly through the 1960s, with published works by Esa Hovinen, Erkki Pesonen and Teivo Pentikainen. Finland also has a strong actuarial program at the University of Helsinki.

Robert Anderson, (center), presented a 100-year anniversary gift from the CAS to the Finnish Actuarial Association President Pientinalho (left) and Vice President Kuosmanen (right).

The FAA has a current active membership of about 350 actuaries with about 100 of them fully credentialed within their system. The Finland non-life insurance market makes up about 21% of the Finland insurance market (life insurance 17%, pensions 62%) and is dominated by three local carriers, OP Financial Group, LähiTapiola and If P&C Insurance. To learn more about the FAA and its rich history, visit their website at actuary.fi.

Leadership Skills Newsletter Offered to Members

Recognizing the need for all CAS members to learn leadership skills, the Leadership Development Committee (LDC) recently decided to open its newsletter to the full membership. With access to the newsletter, the committee hopes readers will be able to further engage with their volunteer teams to drive more effective communication and collaboration. The goal for the LDC newsletter is to aid in developing diverse, passionate and skilled volunteers who can become part of a strong leadership pipeline and assume CAS leadership roles.

The LDC strives to bridge the volunteer leadership gap by making sure the CAS has prepared current volunteers to take on leadership roles in the organization over time. Four subgroups lead the charge:

- The Future Leaders subgroup works to identify rising leaders and provides them with resources to grow.
- The Leadership Courses subgroup creates and distributes leadership content through webinars and in-person sessions.
- The Mentoring subgroup connects emerging leaders with seasoned CAS volunteers.
- The Communications subgroup creates and distributes the LDC newsletter, now available to all members.

The recent newsletter addresses progress with the Volunteer Staff Framework; motivating and engaging volunteers; and a summary of the LDC session held at the 2021 Annual Meeting, "Communicating with a Non-Technical Audience."

You can download the complete newsletter at https://bit.ly/LDCNews.

Competitions Cultivate New Generation of P&C Actuaries in China

By RAN GUO, FCAS, CAS COUNTRY MANAGER, CHINA

China currently represents the largest international market for CAS exams outside of North America. From 2016 to 2021, the CAS offered nearly 2,400 of its exams in China. The CAS also already has over 200 FCAS and ACAS members in China, and we continue to develop ways to engage them in professional development and volunteering. China's P&C market writes an annual direct written premium (DWP) of 1.17 trillion yuan (approximately $174 billion in the U.S. as of this writing), and the demand for actuaries is estimated to be over 40,000 by 2027 according to the China Association of Actuaries.

As part of promoting the field of actuarial science and providing insight into the actuarial profession, the CAS launched a series of data analysis competitions, the first of which started in 2020 and was sponsored by Liberty Mutual China. The 2022 competition, titled "The Pricing War," ran from March 1 to April 9 and drew more than 150 students and early career professionals from the statistics and insurance fields in China. The three-phase program taught practical skills in using predictive modeling, developing pricing strategy and making presentations.

During the first phase of the competition, the participants were asked to set the premium for 10,000 auto insurance policies based on a training dataset of over 500,000 polices. The dataset included information such as car models and claims frequencies. The second phase, and arguably the most unique part of the competition, asked participants to submit their quotes in a "bidding war," where the lowest premium got the policy as well as the associated loss. The result of the first round of bidding was then shared with all the teams. With this "market information," the participants were asked to tweak their premium quote and bid for a second and final time. In the final phase, the teams with the highest underwriting profit were asked to present their solutions and answer questions from their peers, after which they were judged by an expert group of senior pricing actuaries.

JiaWei Li, a member of the winning team from the Southwestern University of Finance and Economics, found the competition edifying and captivating. "We managed to put theory into practice," said Li, "[We] felt the charm of insurance data analysis, deepening our understanding of actuarial science, especially non-life insurance actuarial science."

Jie JiaHao, a member of the Hong Kong University team that won second place, said the competition created more awareness of P&C insurance. "This activity has made us more interested in property insurance and eager to further explore more interesting contents in the field of property insurance," he said.

This competition was designed considering the current saturation of the auto insurance market in China, where existing property insurance companies will likely have to strengthen their pricing and market segmentation to grow and be profitable.

CAS staff and volunteers continue to build relationships with universities, to broaden overall understanding of the P&C market and actuarial profession and to strengthen the CAS pipeline of candidates in China, which is in keeping with the CAS Strategic Plan.

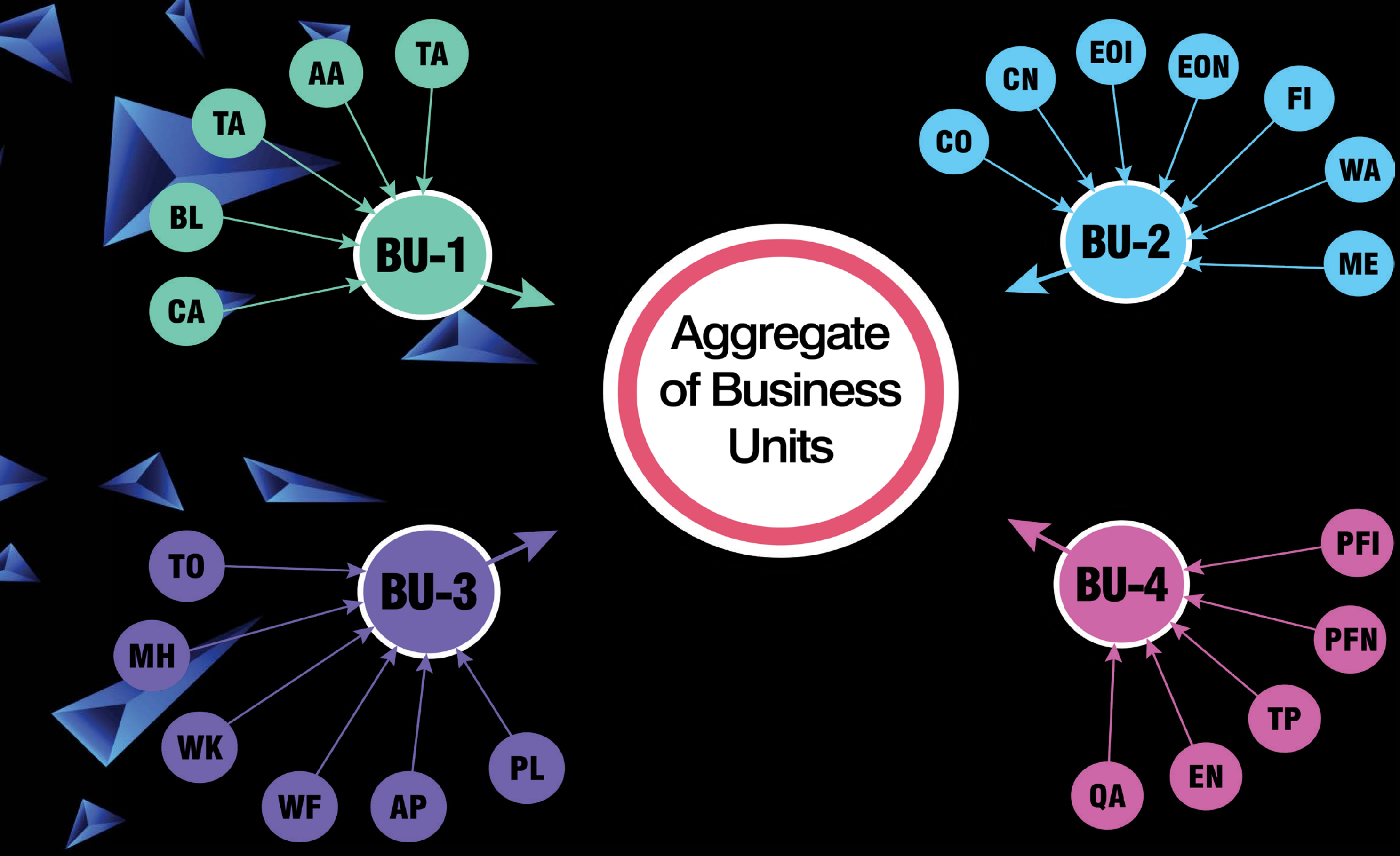
One Single Composite Model

The Multiple Probabilistic Trend Family (MPTF) modeling framework of ICRFS™ gives:

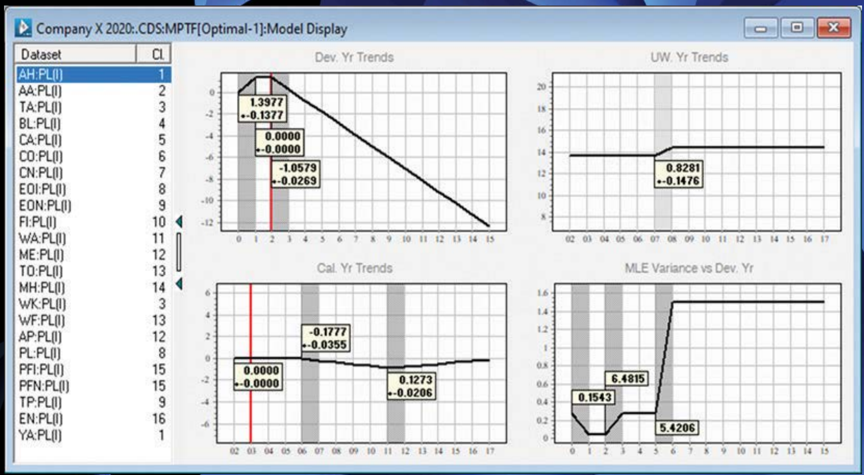
- one single optimal composite model identified from the data for multiple lines of business and segments
- a company wide picture encapsulating trends (including social inflation) and volatility in each line (or segment) and relationships between them
- the diversification credit based on volatility correlations between lines/segments and any common drivers all driven by the data
- risk capital metrics for optimal risk capital management - including reinsurance

Access to much information by segment, business unit, or any combination of aggregates with a few mouse clicks!

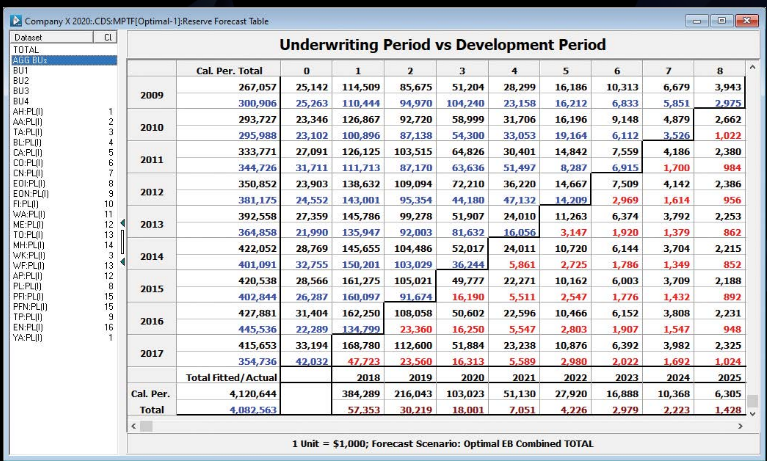
Company X:One Composite Model



The composite model retains the trend and volatility structure identified for each individual segment. Segments are linked by volatility correlations. Common drivers across segments, if found, form a stronger relationship than volatility correlation as movement in means is a more direct relationship than randomness.



The forecast tables are available for all individual segments, as well as any selection of aggregates, or aggregates of aggregates. As usual the black numbers are fitted [projected] mean values, the blue numbers are observed values, and the red [burgundy] values are standard deviations for each cell [aggregate]. For each segment the forecast distribution for each cell is lognormal.

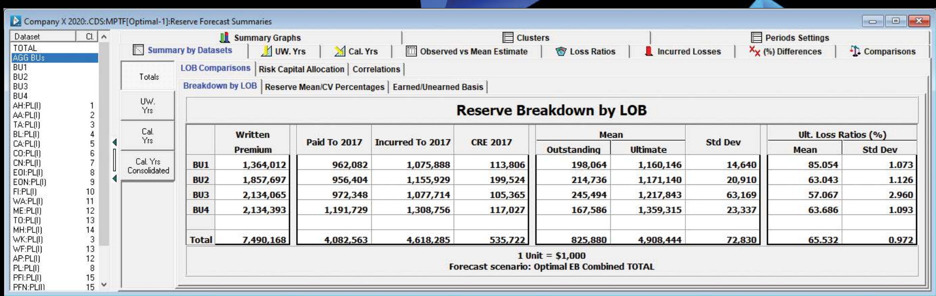

Company X 2020:.CDS:MPTF[Optimal-1]:Reserve Forecast Table

Underwriting Period vs Development Period

	Cal. Per. Total	0	1	2	3	4	5	6	7	8
2009	267,057	25,142	114,509	85,675	51,204	28,299	16,186	10,313	6,679	3,943
	300,906	25,263	110,444	94,970	104,240	23,158	16,212	6,833	5,851	2,975
2010	293,727	23,346	126,867	92,720	58,999	31,706	16,196	9,148	4,879	2,662
	295,988	23,102	100,896	87,138	54,300	33,053	19,164	6,112	3,526	1,022
2011	333,771	27,091	126,125	103,515	64,826	30,401	14,842	7,559	4,186	2,380
	344,726	31,711	111,713	87,170	63,636	51,497	8,287	6,915	1,700	984
2012	350,852	23,903	138,632	109,094	72,210	36,220	14,667	7,509	4,142	2,386
	381,175	24,552	143,001	95,354	44,180	47,132	14,209	2,969	1,614	956
2013	392,558	27,359	145,786	99,278	51,907	24,010	11,263	6,374	3,792	2,253
	364,858	21,990	135,947	92,003	81,632	16,056	3,147	1,920	1,379	862
2014	422,052	28,769	145,655	104,486	52,017	24,011	10,720	6,144	3,704	2,215
	401,091	32,755	150,201	103,029	36,244	5,861	2,725	1,786	1,349	852
2015	420,538	28,566	161,275	105,021	49,777	22,271	10,162	6,003	3,709	2,188
	402,844	26,287	160,097	91,674	16,190	5,511	2,547	1,776	1,432	892
2016	427,881	31,404	162,250	108,058	50,602	22,596	10,466	6,152	3,808	2,231
	445,536	22,289	134,799	23,360	16,250	5,547	2,803	1,907	1,547	948
2017	415,653	33,194	168,780	112,600	51,884	23,238	10,876	6,392	3,982	2,325
	354,736	42,032	47,723	23,560	16,313	5,589	2,980	2,022	1,692	1,024
	Total Fitted/Actual		2018	2019	2020	2021	2022	2023	2024	2025
Cal. Per.	4,120,644		384,289	216,043	103,023	51,130	27,920	16,888	10,368	6,305
Total	4,082,563		57,353	30,219	18,001	7,051	4,226	2,979	2,223	1,428

1 Unit = $1,000; Forecast Scenario: Optimal EB Combined TOTAL

Forecast summary breakdowns are available for each aggregate - and include a number of tables showing allocations into each element comprising the selected aggregate (here business unit).


Company X 2020:.CDS:MPTF[Optimal-1]:Reserve Forecast Summaries

Summary Graphs | Clusters | Periods Settings

Summary by Datasets | UW. Yrs | Cal. Yrs | Observed vs Mean Estimate | Loss Ratios | Incurred Losses | (%) Differences | Comparisons

LOB Comparisons | Risk Capital Allocation | Correlations

Breakdown by LOB | Reserve Mean/CV Percentages | Earned/Unearned Basis

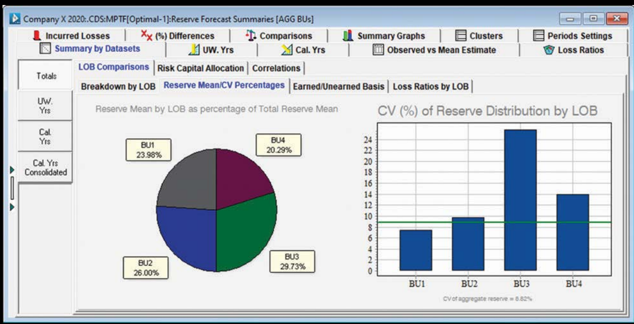
Reserve Breakdown by LOB

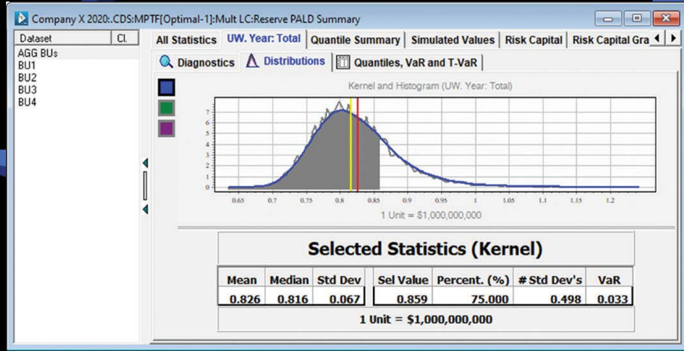
	Written Premium	Paid To 2017	Incurred To 2017	CRE 2017	Mean Outstanding	Mean Ultimate	Std Dev	Ult. Loss Ratios (%) Mean	Ult. Loss Ratios (%) Std Dev
BU1	1,364,012	962,082	1,075,888	113,806	198,064	1,160,146	14,640	85.054	1.073
BU2	1,857,697	956,404	1,155,929	199,524	214,736	1,171,140	20,910	63.043	1.126
BU3	2,134,065	972,348	1,077,714	105,365	245,494	1,217,843	63,169	57.067	2.960
BU4	2,134,393	1,191,729	1,308,756	117,027	167,586	1,359,315	23,337	63.686	1.093
Total	7,490,168	4,082,563	4,618,285	535,722	825,880	4,908,444	72,830	65.532	0.972

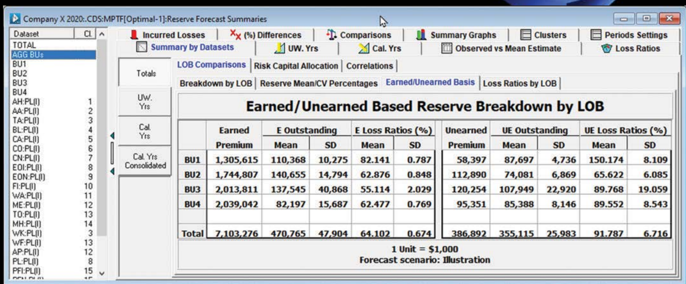
1 Unit = $1,000
Forecast scenario: Optimal EB Combined TOTAL

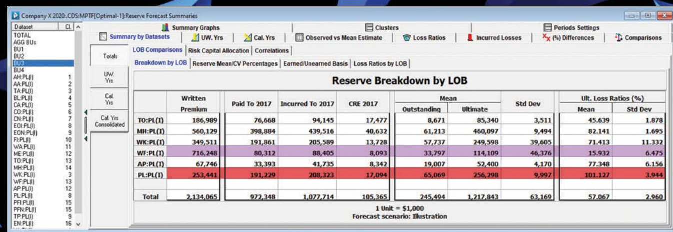
Insureware
Innovative Statistical Solutions for P&C Insurance

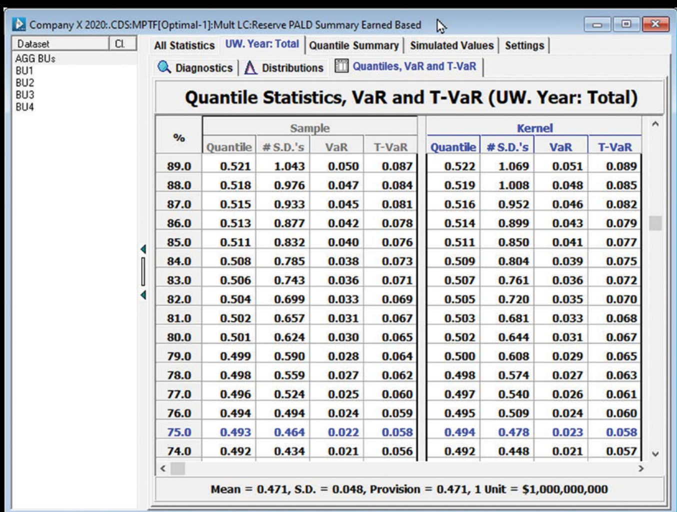
From one composite model

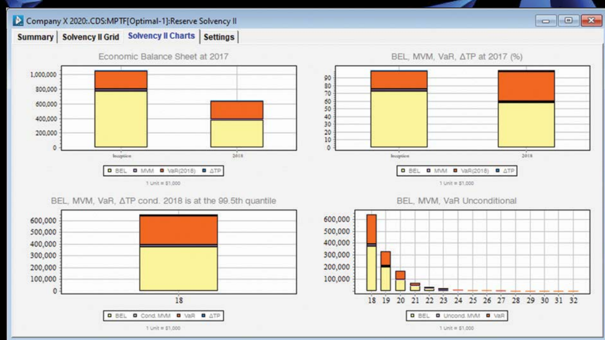


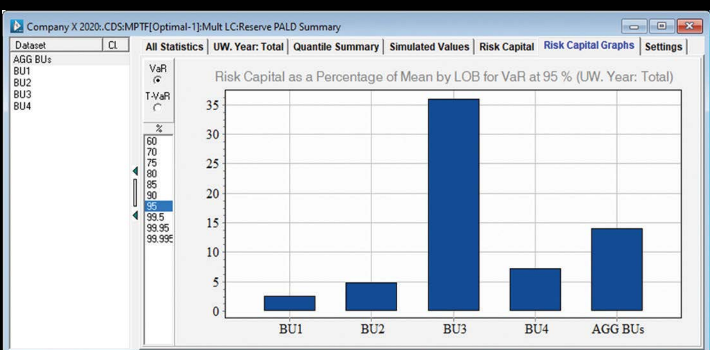


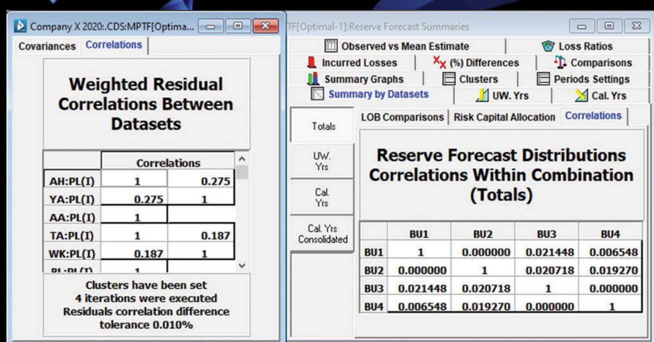


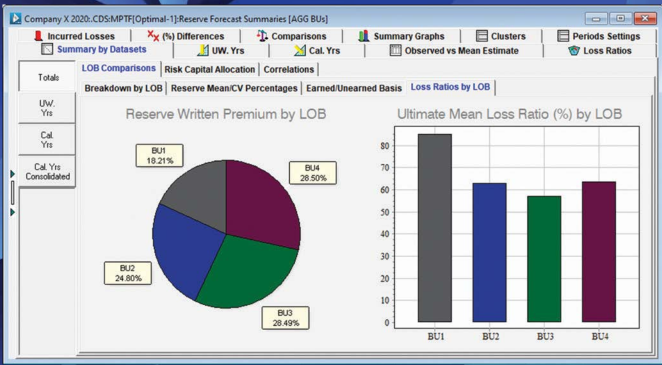


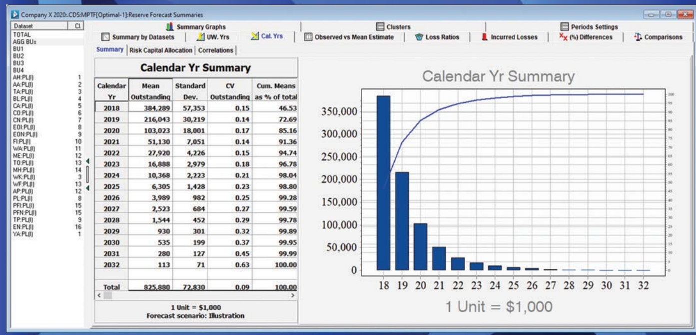


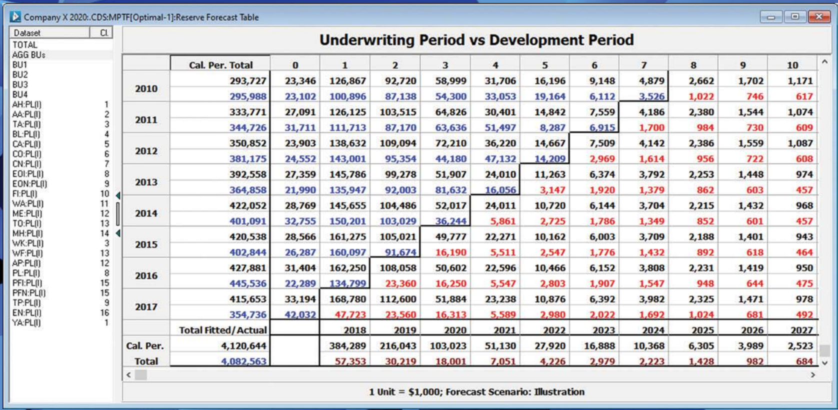


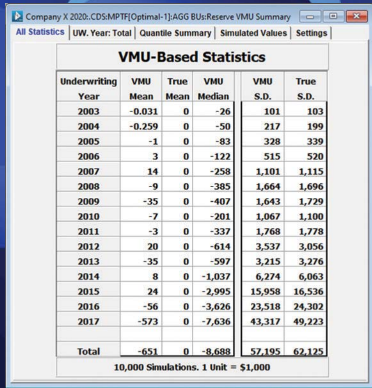


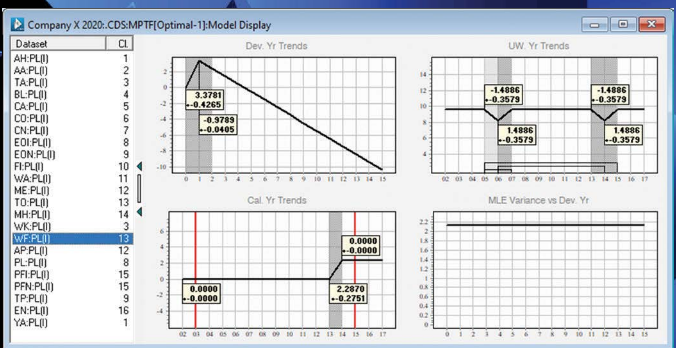


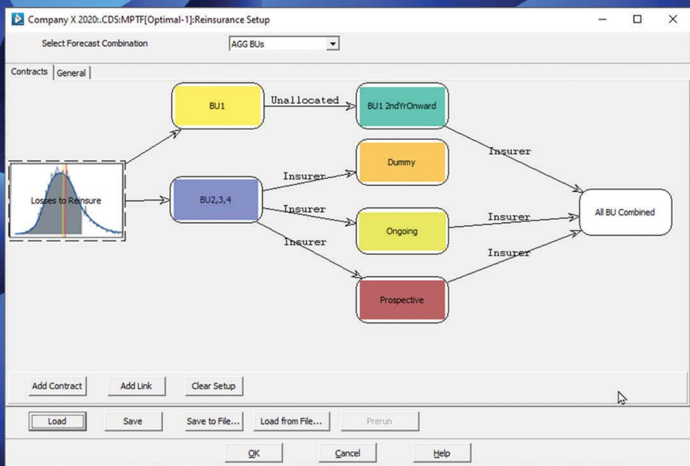


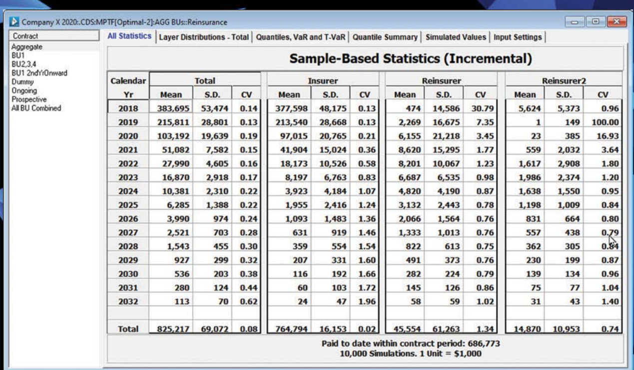


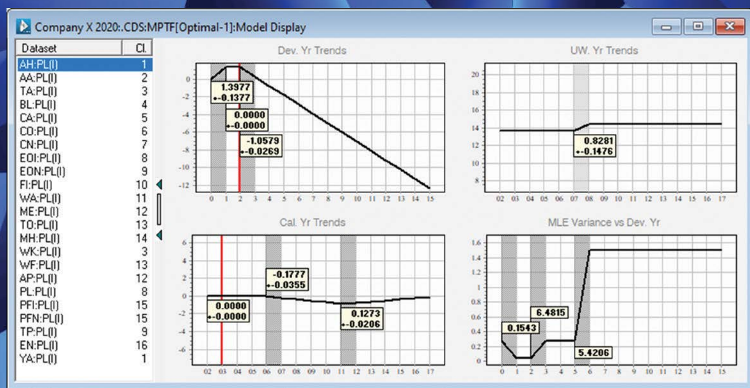






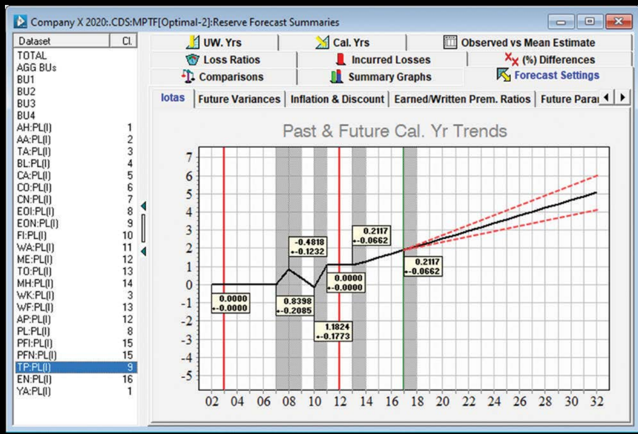






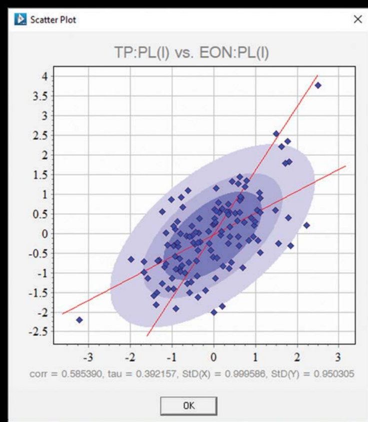
comes a wealth of information

Get more from ICRFS™



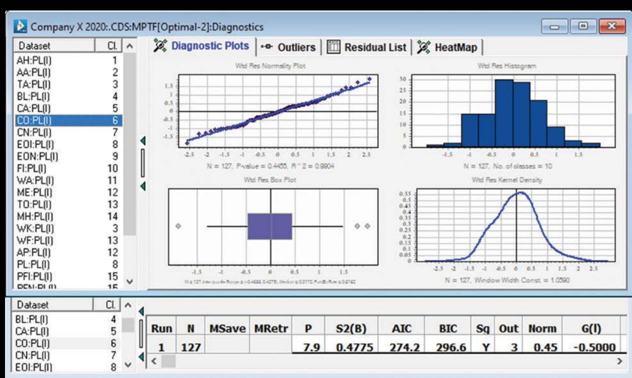
Quantify social inflation in long-tail LoBs

There are many reasons for insurance and reinsurance companies to have concerns about inflation – not only economic inflation (which is rising around the world), but also social inflation. With the Multiple Probabilistic Trend Family modeling frameworks, actuarial analysts can identify the inflationary trends in their Lines of Business.



Common drivers versus correlation

Common drivers have much stronger impact on reserving and pricing than correlations in the randomness. Trends imply means moving in tandem, typically arising from social or economic sources. The ICRFS™ software solution allows you to quickly distinguish between common drivers and volatility correlation.

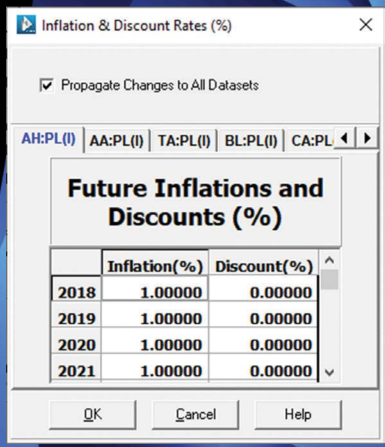


Mitigate model specification risk

It is not enough to have a model crunching out forecasts. The model, and forecast, must project the future losses utilising all information available and have clear markers to determine quality of the projection. ICRFS™ modeling frameworks have diagnostics that enable analysts to minimise the risk of selecting a poor model. Forecast scenarios are interpretable relative to historical trends.

Sensitivity testing

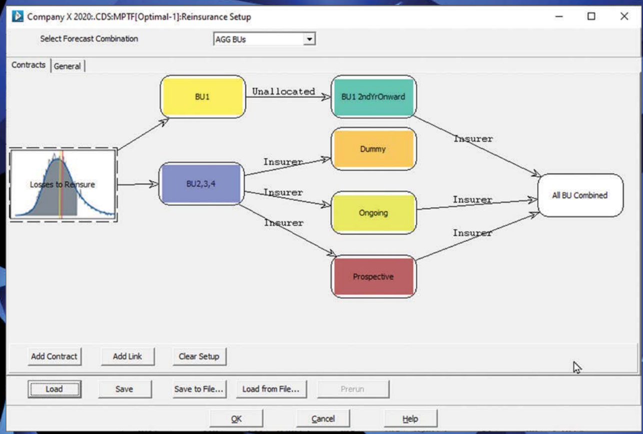
The Multiple Probabilistic Trend Family modeling frameworks have calendar period trends as a fundamental feature of the model definition. They are also an essential component of any future forecast scenario. Assessing the impact of increases/decreases in social or economic inflation is a trivial analysis step.



Comprehensive Reinsurance module

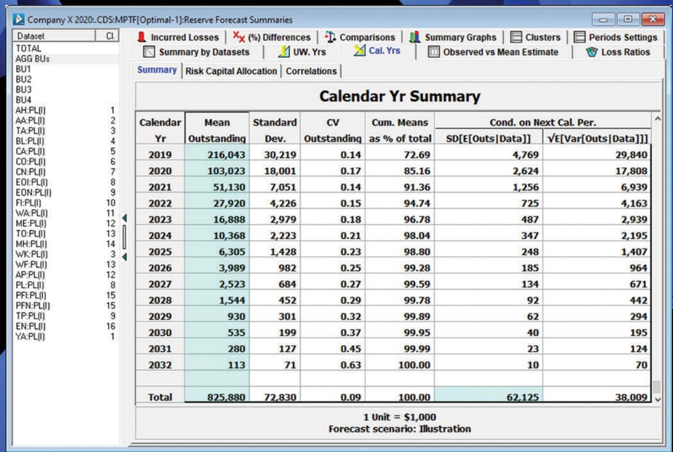
ICRFS™ includes a comprehensive reinsurance component for assessing and monitoring any reinsurance applying to the aggregate of claims – like an LPT or ADC.

Further, reinsurance contracts can be stacked sequentially or in parallel with capital being distributed in any number of ways.



IFRS 17 ready metrics

- Liability stream by calendar period - including the application of discount rates
- Models for underwriting year, accident year, or report year
- Separation of Earned and Unearned reserves
- Various methods for calculating risk margins
- Complete data integrity by separating data management from software users - source data are read only
- Complete history retained in database



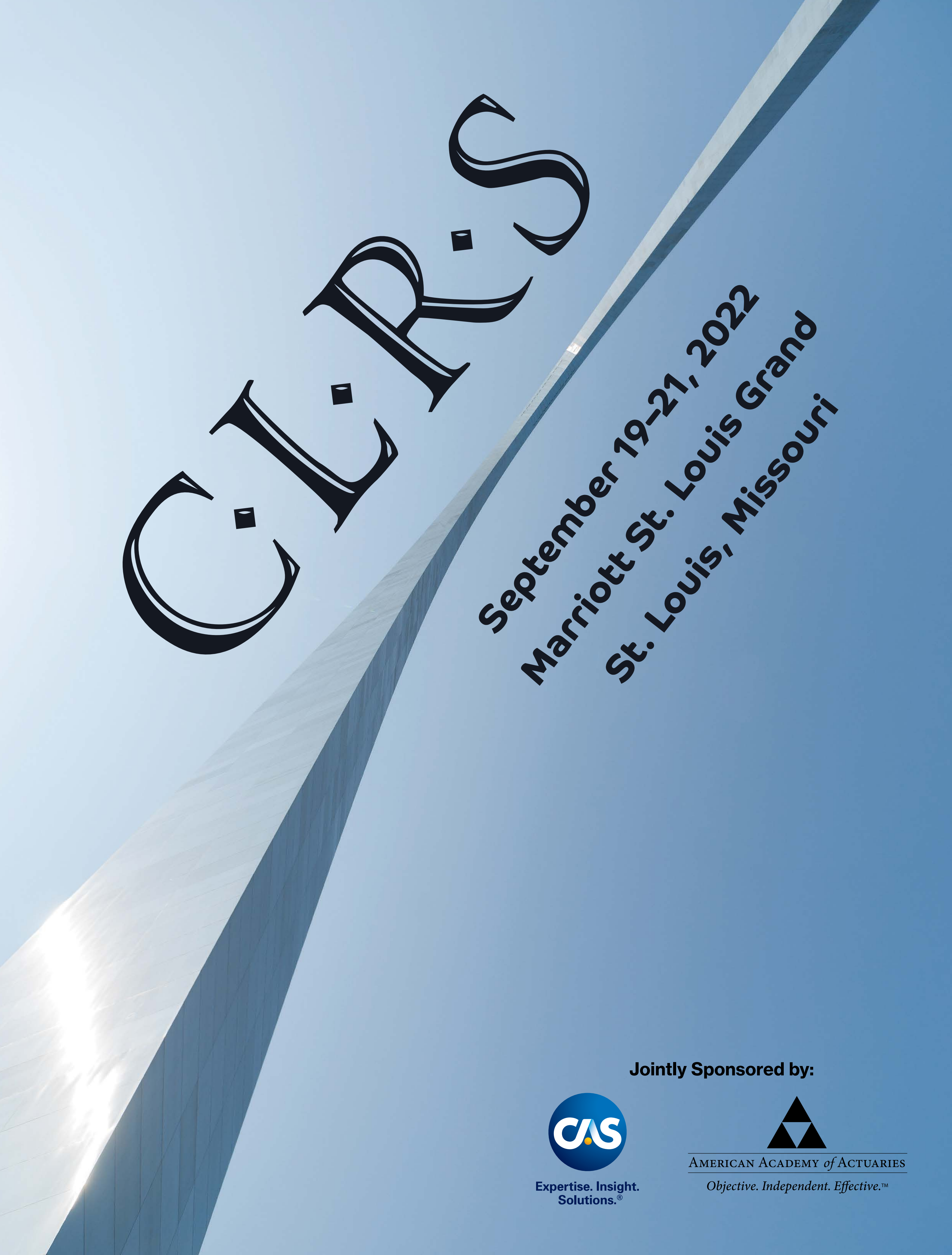
Calendar Yr Summary

Calendar Yr	Mean Outstanding	Standard Dev.	CV Outstanding	Cum. Means as % of total	Cond. on Next Cal. Per. SD[E[Outs|Data]]	Cond. on Next Cal. Per. √E[Var[Outs|Data]]
2019	216,043	30,219	0.14	72.69	4,769	29,840
2020	103,023	18,001	0.17	85.16	2,624	17,808
2021	51,130	7,051	0.14	91.36	1,256	6,939
2022	27,920	4,226	0.15	94.74	725	4,163
2023	16,888	2,979	0.18	96.78	487	2,939
2024	10,368	2,223	0.21	98.04	347	2,195
2025	6,305	1,428	0.23	98.80	248	1,407
2026	3,989	982	0.25	99.28	185	964
2027	2,523	684	0.27	99.59	134	671
2028	1,544	452	0.29	99.78	92	442
2029	930	301	0.32	99.89	62	294
2030	535	199	0.37	99.95	40	195
2031	280	127	0.45	99.99	23	124
2032	113	71	0.63	100.00	10	70
Total	825,880	72,830	0.09	100.00	62,125	38,009

1 Unit = $1,000
Forecast scenario: Illustration

Insureware provides more than just software. We create a collaborative relationship with all our clients. Contact Insureware (info@insureware.com) to arrange a virtual coffee meeting to discuss how ICRFS™ can work for you!

Insureware
Innovative Statistical Solutions for P&C Insurance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2022 CAS ELECTION

CAS Voting Members (All Fellows, plus Associates who have been members for at least five years) will vote on a slate of candidates for the CAS Board of Directors and CAS President-Elect, with online voting beginning on August 1, 2022. On that day, Voting Members will receive an email with a link to the online ballot. Completed ballots must be submitted online by August 31, 2022.

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 at https://www.casact.org/about/leadership-and-staff/elections/meet-candidates. Please contact Mike Boa (mboa@casact.org) with any questions or comments about the election process.

Meet the *Candidates*

President-Elect Nominee

Frank H. Chang

FCAS 2009

I am excited for the opportunity to contribute to the future of the CAS by focusing on the inherent value of actuaries. I believe in our community, our standards and our education as well as in the value of our profession. As president-elect, I hope to improve the perception of the CAS among both prospective actuaries at the start of their career as well as across a broad set of employers within and outside of the insurance industry. I humbly ask for your vote.

Board Director Nominees

Steve Belden

FCAS 1983

I have distinguished myself through hard work on several CAS committees. I consider myself well informed on several key issues. There are many more that need board attention. I will diligently read, ask questions and inform myself so that I can better contribute to good board decisions. If elected, I want all of you to feel free to question me on issues that you see, either that the CAS should tackle or where you believe we should change our direction. I will work with the board to be sure that I represent faithfully our thoughts as I respond to you.

Carolyn (Coe) Bergh

FCAS 2006

I feel the board has fallen short of its duty to represent all of its members. More effort needs to be made in soliciting member input, prior to implementing changes in policy or strategy. The model for exposure draft comment and feedback would be a familiar way of soliciting this input, and I would like to see it used more frequently. This way, members can see the policies, have input, seek others' input and ultimately see their views in the final draft or understand why another direction was decided.

John Gleba

FCAS 1999

As a member of the CAS board, I will strive to uphold basic principles of fairness, membership focus and promotion of equal opportunities without bias. I believe that the CAS exists because of its members and that it owes a duty to preserve the rights of those members, to act in their best interest and to push the Society in a direction that increases the opportunities available to current and future members.

Alan M. Hines

FCAS 1990

My business background, professional achievements and extensive experience/service in the CAS has provided me the skills and knowledge needed to make a significant contribution as a member of the CAS Board and effectively serve our members. If elected, I will advocate for a strategic plan that enhances our name recognition, expands our recognized services beyond insurance and leverages our professional standards to create greater demand for the services we perform. I will also strive to reunite our membership by soliciting member input on the strategic plan and improving transparency of the board's decisions and actions.

Julie Lederer

FCAS 2014

I started my actuarial career in consulting and then became a regulator for the Missouri Department of Commerce and Insurance. During my time in regulation, I have been active on NAIC committees, including the Casualty Actuarial and Statistical Task Force and the Actuarial Opinion Working Group. As such, I could offer one regulator's perspective on issues that affect the CAS. I understand the value that the actuary provides to the insurance industry and to insurance consumers, and I would encourage the CAS to maintain focus on ensuring high standards for admission, offering relevant professional education, and fostering research.

Len Llaguno

FCAS 2010

For the past 10+ years I've been working to combine actuarial theory with machine learning. I founded KYROS Insights to deploy these innovations to help loyalty programs predict redemptions, reserve for their points liability and solve several other business problems. We have clients around the globe, including many of the world's largest brands. Through this work, I've seen how powerful these approaches can be to solve problems that traditional actuarial methods could not. I believe leveraging these advances in our toolbox is critical to the future of our profession. I would like to help make this happen.

Amber Rohde

FCAS 2013

My passions and experience align well with the CAS Strategic Plan. I have extensive experience globally as a leader (both professionally and as a volunteer) as well as progressing the advancement of diversity, equity and inclusion in our field. As we move toward the visions laid out in both the Strategic and Admissions Transformation Plans, I believe it's crucial we are agile along the way. The CAS must remain admired for our credentials and contributions to the industry globally. I would be honored to continue my work progressing the three pillars and representing the voice of our CAS global community.

David Skurnick

FCAS 1971

During my long career I contributed to actuarial professionalism by writing articles, leading seminars, teaching actuarial courses, participating on the Examination Committee, serving on the Board of Directors, leading local actuarial clubs and writing and presenting actuarial shows. The CAS leadership has gotten distracted with non-actuarial matters. I am running for the board in order to get the CAS to more fully promote actuarial professionalism.

Behavioral Science — A Useful Addition to the Actuarial Toolbox

By DALE PORFILIO

CAS members excel at analytical, data-driven risk assessment, judging by whom we recruit to the profession, who passes the rigorous series of actuarial exams and who employs our 9,500 members and many more actuarial candidates. Despite all this success, Gleb Tsipursky — featured speaker at the 2022 CAS Spring Meeting — has identified another essential tool for our actuarial toolbox: behavioral science.

Tsipursky is a world-renowned thought leader in future-proofing, decision making and cognitive bias risk management in the future of work. He is CEO of the boutique future-proofing consultancy Disaster Avoidance Experts, which specializes in helping leaders avoid threats and missed opportunities. A best-selling author of four books and frequent speaker to a wide range of audiences, Tsipursky's insights have been featured in over 550 articles and 450 interviews in prominent venues. His speech was based on his global best-seller *Never Go With Your Gut: How Pioneering Leaders Make the Best Decisions and Avoid Business Disasters* (Career Press, 2019). The CAS bought digital copies of his book for all attendees, as well as 100 paperback copies that he signed for attendees after the presentation.

Actuaries are often the unsung heroes in our organizations by providing the ounce of prevention that prevents the many pounds of cure through our risk management efforts. But sometimes our organizational stakeholders don't make the best decisions. They might ignore our data-driven recommendations to the detriment of our companies, our departments and sometimes even our careers. Tsipursky attributes this shortsightedness to mental blind spots that behavioral scientists call cognitive biases, which cause people to misinterpret data, deny risks and make poor decisions.

Primer on behavioral science and cognitive biases

Following are quick definitions and descriptions of several key terms and concepts from behavioral science. The "framing effect" acknowledges that what we see and how we make decisions is powerfully shaped by how the information is presented to us. The same information can lead to different outcomes, depending on what is emphasized. How the information is framed can lead to risk denialism and poor decisions.

The "ostrich effect" describes the all-too-common intuitive response to deny risk, flinching away from unpleasant information about threats, problems and risk due to negative emotions. Disaster avoidance experts conducted a study of 286 organizations that fired their top leaders across four years. They found that 23% were fired for denying negative facts or risks to the peril of their organizations.

The "horns and halo effect" describes the human inclination to let our first impression of one characteristic about a person influence how we view all other characteristics. If we dislike the first characteristic, then its "horns" color everything else. If we have a positive initial view, the "halo" effect leads us to have too positive a view of the rest. This is especially challenging for actuaries trying to address risk denialism.

"Confirmation bias" reflects our brain's preference to look for information that confirms our preexisting beliefs while ignoring information that contradicts them. It feels good to be right and bad to be wrong, so people don't try to disprove their beliefs if this obscures the truth. This is apparent in how some people digest the news and how some business leaders receive actuarial analyses.

"Attentional bias" is when we focus on the most emotionally salient aspects of our environment, rather than on other factors and risks that may be just as important. In short, our minds pay attention to and emphasize what confirms our beliefs. This is especially important as we seek to develop high-performing teams, which optimally have a healthy mixture of staff with optimism and pessimism biases.

Why should you care about all of these behavioral science concepts? Because 90% of behavior and decisions are

	Strengths	Weaknesses
Optimism Bias	Innovative, creative, cheerleader, motivator, visionary, entrepreneur, founder	Risk blindness, shiny new object syndrome
Pessimism Bias	Improver, fixer, maintainer, controller, implementer, devil's advocate, manager	Risk aversion, stagnation

driven by emotions and only 10% by rational thinking, according to Tsipursky. People need to care about the situation before them and become emotionally invested in fixing these judgment shortcomings. To address these blind spots, research shows we need to:

1. Identify where we fall into these mistakes.
2. Recognize the pain points they cause us.
3. Develop an emotional commitment to protect ourselves from these pain points.
4. Take specific research-based steps motivated by these emotions to overcome cognitive biases.

Tsipursky closed this segment of his presentation by encouraging the audience not to take on too much at once. Treat all of these cognitive biases as a menu of options and choose the one that seems most urgent to address in the short term. Decide what concrete steps can be taken to address it and try it out. If it works, identify other low-hanging fruit from the menu. If it doesn't work, try variations until you achieve some progress.

Time for application of behavioral science to actuarial science

Tsipursky shared several techniques to overcome one or more of the cognitive biases he described. He led off with five key questions for avoiding decision disasters:

1. What important information did I not yet fully consider?
2. What dangerous judgment errors (cognitive biases) did I not yet address?
3. What would a trusted and objective adviser suggest I do?
4. How have I addressed the ways this could fail?
5. What new information would cause me to revisit this decision?

He provided a simple calling card with these questions, keeping them close at hand to consider as we seek to improve how we present our recommendations and participate in key decision making.

He then transitioned to the key problem of how to deal with risk deniers. While actuaries are wired to start from data and analysis, he told us to "stop simply stating facts and risks. It won't work if people deny obvious risks. Don't give in to the temptation to argue and assume emotional blocks are at play."

Instead of arguing solely from the facts, Tsipursky introduced the acronym EGRIP (emotions, goals, rapport, information and positive reinforcement) as an alternative approach.

Emotions

When someone denies obvious facts and risks, it's safe to assume their emotions are to blame. Deploy empathy by seeking to understand their emotions. Identify their emotional blocks and pain points so you can address them in the next steps.

Goals

Establish shared goals. Put yourself on the same side. Doing so is key to building trust and sharing knowledge effectively so they truly listen to you.

Rapport

Build trust by establishing rapport. Show you understand their emotions by using empathic listening and echoing their emotions. Show you share the same goals and care about their interests.

Information

Provide new information that challenges their beliefs. Frame it within your shared goals but be careful about their emotional blocks and pain points. Show how their current beliefs are not aligned with your shared goals. Focus on how your shared goals can be better achieved if they change their beliefs, while making sure new information can help them overcome their emotional blocks and pain points.

Positive reinforcement

After the person shifts their perspective, provide them with positive reinforcement. This will help shift their emotions on the topic and help them be more oriented toward the truth, so they don't have to go through this emotional labor-intensive process too often.

Tsipursky closed his presentation by reemphasizing how actuaries can be the heroes of the post-COVID recovery if we can complement our excellent data-driven risk management with the ability to address cognitive bias risks. He challenged all attendees to commit to applying one of his methods to a work situation during the following week, whether that be targeting a specific cognitive bias, using his five key questions to avoid a decision disaster or applying the EGRIP mnemonic. He gave us new tools for our toolbox. Now it's our responsibility to put them to use.

Dale Porfilio, FCAS, MAAA, is chief insurance officer for the Insurance Information Institute.

Risks Emerge Around Climate-Related Litigation

By DALE PORFILIO

CAS meetings, research and publications have been featuring the physical aspects of climate risk for many decades. This includes studying the frequency and severity of all major weather peril events; the increase in exposure from more homes and businesses being built in harm's way; as well as efforts to strengthen homes, businesses and infrastructure to better withstand weather events.

In addition to physical risk, society is increasingly drawing attention to litigation risk — arising from not considering or responding to the impacts of climate change — and its potential impacts on insurer's profitability and financial strength. The second general session of the 2022 CAS Spring Meeting explored climate-related litigation risk through both the insurance and reinsurance lenses: types of cases, risk drivers and potential impact on reserves of different climate-related scenarios.

Both presenters earned their Juris Doctor and have many years of experience with climate litigation. Tim Fletcher is Gen Re's VP and senior emerging issues specialist. Fletcher's presentation focused on the current litigation environment around climate risk. Robin Wilkinson is Verisk's SVP and managing director of casualty analytics. Wilkinson's presentation focused on modeling for climate litigation risk given the limited history, yet significant exposure for the insurance industry.

Fletcher started the session with an overview of active climate change contribution suits. The litigation defendants have been the "carbon majors" — defined as the 100 or so largest producers of crude oil, natural gas and cement. They include multinational energy producers such as Chevron, ExxonMobil and Shell. A 2017 study estimated these companies produce 71% of greenhouse gas emissions. Climate litigation to date has been based on precedents from the opioid epidemic, with causes of action, such as public and private nuisance, failure to warn, design defect, trespass and negligence.

The ultimate outcome of climate-related litigation will depend heavily on whether the cases are tried in state or federal courts.

The allegations have been based on three primary climate change-related injuries resulting from carbon major conduct: sea-level rise and associated impacts, increased frequency of severe and extreme weather, infrastructure damage and public illnesses.

To win climate-related litigation, plaintiffs must meet *all* of the following conditions:

- Prove that emissions (in aggregate) affected the Earth's climate.
- Prove that emissions (in aggregate) caused specific harm.
- Identify and distinguish specific emissions of many emitters.
- Show that specific defendant's emissions caused harm.

The ultimate outcome of climate-related litigation will depend heavily on whether the cases are tried in state or federal courts. Plaintiffs initially filed lawsuits with state courts, but carbon majors fought to have them moved to federal courts. After a protracted battle that included involvement by the United States Supreme Court, these cases are now being remanded back to the various state courts in which they originated. This development represents a significant game changer because state courts are perceived as being far more receptive to the plaintiffs' arguments than their federal counterparts. In either forum, carbon majors and their insurers will incur mountainous legal costs, regardless of case outcome. In projecting where and how the litigation might turn, Fletcher posited that climate change may be more considered a problem of capitalism, in that it represents an externality created by market economies that consume natural resources while concurrently creating wealth and raising living standards.

Wilkinson then shared her perspective on the direct and indirect liability exposure for the insurance industry. The most impactful direct exposure is liability for contributing to sea-level rise. To win this argument requires attribution science, which is how we decide who caused how much of the damage. This is complicated by the reality that sea-level rise is surprisingly inconsistent by geography. For now, Verisk foresees low probability of liability for contributing to climate change, given the many legal and procedural hurdles, but very high severity, with significant defense costs whether the suits are won or not, especially if companies beyond the carbon majors are drawn into the litigation.

She discussed one aspect of indirect climate litigation exposure being the liability for failing to prepare or mitigate against known and foreseeable risks. She shared multiple examples of natural perils that climate change may be impacting, all of which could produce high-severity liability losses:

- Utilities such as PG&E in California have already been found liable for causing catastrophic wildfires. Could utilities and other industries expect to face increasing litigation as a changing climate heightens the risks of more frequent and more severe fires?
- Could residential developers be found liable for building communities within the wildfire urban interface without taking sufficient resilience measures, such as building homes far enough apart, using fire-resistant roofing and siding or placing flammable vegetation too close to residences?
- Could more energy companies be found liable for pollution events following natural disasters, as happened after Hurricane Katrina, if natural disasters become more frequent and more severe?
- Could there be increased risks of building collapses or failures along the coasts if sea-level rise might worsen the corrosion of building foundations?

She then shifted to an additional indirect climate change liability exposure: corporate liability for misleading disclosures and statements. Even if a public company attempts to responsibly manage its climate risk, Wilkinson and Fletcher agreed that companies may experience lawsuits, securities class actions and regulatory actions when their actions deviate from forward-looking statements the company has shared publicly. Wilkinson shared that Arium has developed models to help insurers estimate both these potential indirect impacts of climate change as well as the direct impacts on their liability portfolios.

Fletcher shared more details about this new trend of securities and consumer-protection suits. Plaintiffs must show that a carbon emitter's representations deceived (or could have deceived) an investor, known as greenwashing. Further, the plaintiffs assert economic harm resulting from the carbon majors lack of candor as to how their activities have contributed to the climate crisis. Suits like this have already been brought by several states (e.g., Minnesota, Connecticut) and municipalities (e.g., Hoboken, New Jersey and Charleston, South Carolina) against different carbon majors. Third-party litigation funding, a key contribution to social inflation for other types of insurance liability, is also seen as contributing to climate risk litigation.

A next chapter of climate litigation risk could include expansion beyond carbon majors— to the many other industries that may contribute to climate change, like commercial trucking, engine manufacturers, mining and fertilizer manufacturers. If and when these suits arise, a number of coverage issues will emerge. These include determination of coverage trigger (injury-in-fact, exposure, manifestation and continuous trigger), as well as coverage defenses (expected or intended loss, loss in progress and potentially pollution exclusions). Further, these suits will likely pose same coverage issues as seen with previous mass torts, such as asbestos, silica and tobacco.

While the probability of high liability losses for climate change contribution seems low, we need to be prepared for potential significant impacts if climate litigation proceeds. At minimum, we could expect increased defense costs as plaintiffs explore the breadth of potential liability risks before us. The industry also needs to be prepared for the indirect risks from climate change that may materially impact liability lines, even if contribution litigation stalls in the courts.

Dale Porfilio is the chief insurance officer for the Insurance Information Institute.

Economic and Social Inflation: How They Impact the Company Actuary

By DALE PORFILIO

The U.S. property and casualty industry is facing increasing challenges with the possibility of an extended period of inflation and rising interest rates. At the same time, social inflation — rising loss experience related to litigation — continues to pressure claim severity, despite pandemic-related court delays. The first general session at the 2022 CAS Spring Meeting featured two speakers seeking to provide guidance for practicing actuaries as they help their organizations navigate these dynamic times.

The first speaker, William Wilt, FCAS, president of Assured Research, explained what is causing the current economic and social inflation affecting P&C insurers. He also discussed what we may expect in a post-pandemic world. The second speaker, William Finn, FCAS, senior vice president and chief actuary of The Hanover Insurance Group, shared practical considerations for dealing with inflation for pricing, reserving and planning from the perspective of a U.S. primary P&C insurer.

Wilt started from the foundational concept of Economics 101 — supply and demand. From the beginning of the pandemic until today, demand for goods has risen while supply declined with supply chain snarls, labor shortages and Russia's attack of Ukraine. This, coupled with a surge in fiscal spending during the pandemic, resulted in rising economic inflation, in turn prompting the Federal Reserve to raise interest rates, all of which has historically led to recessions.

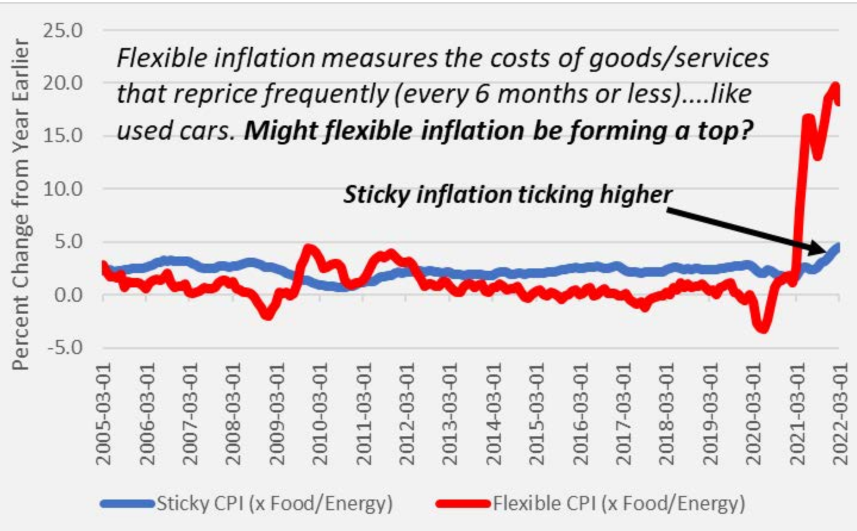
He then dove deeper to differentiate between "sticky" and "flexible" inflation. Flexible inflation measures the costs of goods and services that reprice frequently (every six months or less), while sticky inflation refers to annual contracts like mortgages, rent, medical and education. As captured in Figure 1, flexible inflation jumped early in 2021. Of greater concern, sticky inflation started upward later in 2021. While flexible inflation may come down as quickly as it went up, sticky inflation will require a longer lag to return to prior levels.

As actuaries strive to understand inflationary trends, Wilt shared examples of the explosion of publicly available tools for tracking trends that impact loss costs. The U.S. government provides significant volumes of free data, such as the St. Louis Federal Reserve Economic Database (FRED), which includes thousands of time series across the economic spectrum. Other examples include Google trends, real-time auto crash data, office occupancy indicators, public transportation data, active futures markets and medical costs from the Centers for Medicare & Medicaid Services (CMS) Office of the Actuary.

Wilt then pivoted to social inflation, which he posits matters more than economic inflation because it is harder to neutralize through pricing actions. Civil case filings fell in both 2020 and 2021 because so many courts were closed for the pandemic, with 2021 finishing 21% below the peak in 2019. But Assured Research believes the underlying symptoms driving litigation have only increased during the pandemic. They expect social inflation pressures to return as court activity resumes.

When the liability insurance crisis hit in the 1980s, many states took legislative action to implement tort reforms which helped stabilize the market and improve liability insurance combined ratios. Assured Research does not see

Figure 1. Sticky v Flexible Inflation



Source: "Economic and Social Inflation." © 2022 Assured Research, LLC. Used with permission.

major incentives for tort reform today, other than the Florida property insurance crisis. This topic is sufficiently problematic to merit its own concurrent session at the CAS Spring Meeting.

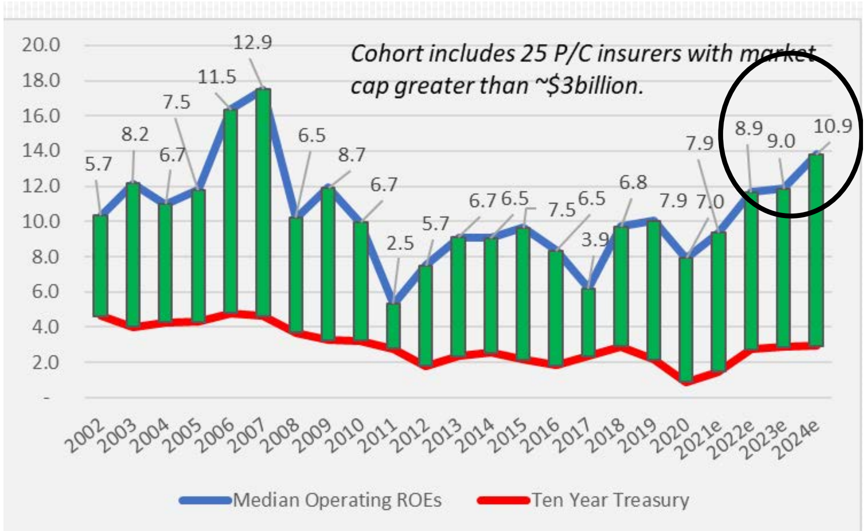
Wilt concluded his presentation with these points about inflation's impact on the insurance industry:

- History teaches us that the earnings cycle follows the pricing cycle, with combined ratios tending to decline for approximately three years after the peak of each pricing cycle.
- Reserve balances appear broadly healthy, with particular redundancies in workers' compensation.
- Insurers are adept at neutralizing the adverse impact of inflation through pricing, while investment income rises as interest rates increase.
- Therefore, insurers' ROE can be expected to increase over the next few years, from a low of 7% in 2020 at the beginning of the pandemic to nearly 11% in 2024, as captured in Figure 2.

Finn then shared his perspective about how inflation impacts the practicing actuary. Actuaries routinely predict the future by studying the past, and this clearly is more challenging when we are living through a rapidly changing environment. For example, the industry has experienced dramatic reserve development in commercial auto liability and workers' compensation for nearly two decades, with an inverse pattern between the two lines from 2011 to 2020 (see Figure 3).

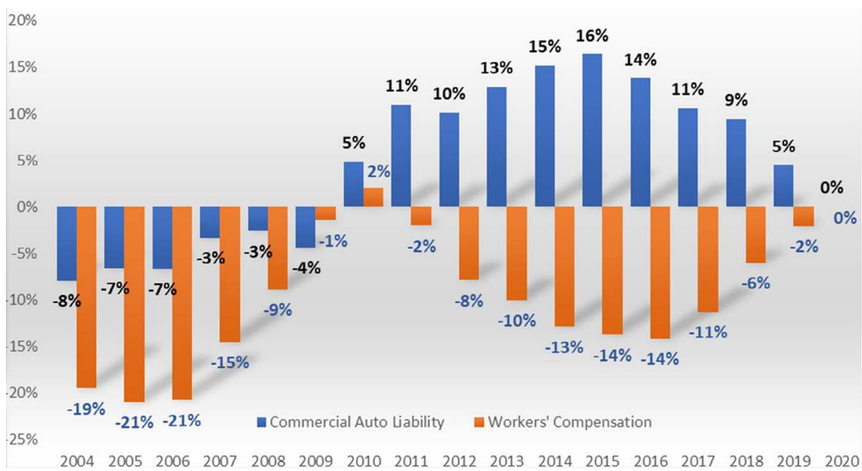
He provided a rubric for thinking about the impacts of economic inflation across major lines of business, whether you are responsible for pricing, reserving or financial planning.

Figure 2. Earnings Forecasted to Rise 2022–2024E.



Sources: © 2022 S&P Global Market Intelligence, WSJ (Treasury forecast April,2022), Assured Research. Pricing data as of 4/19/22.

Figure 3. Percentage Change from Initial to Most Recent Estimate



Source: 2021 Schedule P Industry Data (SNL).

1. What economic components (e.g., lumber, vehicle parts, medical costs) influence the product line?
2. How do we track it (e.g., composite indices, medical CPI)?
3. What is the exposure sensitivity (e.g., payroll, building value)?
4. What else can we do (e.g., pricing, exposure, forward-looking costs)?

He proceeded to apply this rubric for six major product lines: workers' compensation, commercial property, general liability, commercial auto, homeowners and personal auto. If we do this well, we can help our companies understand, anticipate and manage through this spike in economic inflation.

Finn then turned our attention to social inflation, which has been prominent in commercial auto because of high limits, at-fault claims, sympathetic plaintiffs and less sympathetic defendants. Traditional backward-looking reserving methods can mistake litigation delays for favorable case development. Claim pattern changes can be missed for multiple planning cycles, and changes in signals can be mistaken for noise.

The pandemic complicates any actuarial analysis trying to identify, quantify and adjust for social inflation. Litigation trends have been slowed for two years now, still not yet back to its pre-pandemic pace. Allocation of medical resources to COVID delayed all other elective and preventative medical treatments. The long-term impacts of COVID survivors are being heavily discussed, but the long-term impacts from delay in all other treatments could be even more impactful to insurance losses.

Finn concurred with Wilt that the underlying environment of litigation financing, outsized jury awards and societal changes have not changed. We need to be watching for the signals of social inflation to determine whether we will experience a gradual resumption or rapid catch-up to pre-COVID trends. Finn closed with this aspirational challenge for all practicing actuaries:

> Our job must be more than predicting the future. It must involve discussion of the risks associated with predictions, the signs that those predictions could be flawed, and an acknowledgment of the business impacts of errors in our underlying assumptions. It must also include driving innovation in our thinking and our analytics, and a commitment to developing our young talent to be agile, courageous and broad thinking actuaries and insurance business professionals.

IABA Releases Results of its 2022 Work Culture Survey

By DWAYNE HUSBANDS, FSA, CFA, MAAA, IABA PRESIDENT

Since 2020, the International Association of Black Actuaries (IABA) has conducted an annual Work Culture survey amongst its professional members (those employed in the actuarial field). The purpose of the anonymous survey is to better understand the impact of diversity, equity and inclusion (DEI) practices within the industry. The survey allows us to get a pulse from the perspective of Black actuaries on what industry practices are working and where we need to see improvement.

Each year, survey results are compiled, and a high-level overview of the results (e.g., themes, areas of success, areas of concern, etc.) is shared with IABA's corporate partners. IABA extrapolates common themes, areas of success, concerns and improvement based on responses and experiences of the membership. These efforts are intended to drive measurable change in the industry. Common themes can help illustrate how the industry is doing from a DEI perspective and shape practices of actuarial employers going forward.

2022 survey results

The Work Culture survey primarily consists of several multiple-choice questions focused on employment. Response options include strongly agree, agree, neutral/neither agree nor disagree, disagree and strongly disagree. Below summarizes 2022 survey results, organized by responses in comparison to prior years.

1. Major Improvement in Respondents Who Agree:
   - I am satisfied with my opportunities for professional growth.
2. General Improvement in Respondents Who Agree:
   - I have a clear understanding of my career or promotion path.
   - My supervisor and I have a good working relationship.
   - I understand how my work impacts the organization's business goals.
   - My organization, overall, is dedicated to diversity and inclusiveness.
   - My actuarial department/team is dedicated to diversity and inclusiveness.
3. Decrease in Respondents Who Agree:
   - Communication between senior leaders and employees is good in my organization.
   - Management within my organization recognizes strong job performance.

- Senior management and employees trust each other.

4. Consistent Number of Respondents Who Disagree:
   - I have an employer-sponsored mentor at my workplace.

Based on the 2022 responses, it appears IABA members have a better understanding of how they fit into their respective organizations and how their work impacts business objectives. There was also a general uptick in respondents who believe employers are committed to DEI, and many more respondents seemed satisfied with job/profession growth opportunities compared to prior survey results. These are all positive signs that the industry is moving in the right direction in regard to DEI. There was a decrease, however, in positive responses to questions related to strong communication and trust between senior leaders and employees, as well as recognition of strong job performance. Communication and trust are issues companies in general have struggled with over the past few years — especially since the beginning of COVID-19 — and is the result of many employees now working remotely. Companies should explore ways to improve/restore communication and trust within their organizations as the workforce continues to transition and evolve.

A notably shocking survey response is that over 60% of survey participants responded that they do not have an employer-sponsored mentor at their current employer. This response is consistent with prior years and needs to be addressed. Mentors, coaches and counselors are integral to employees' development and career trajectories. This is especially true for diverse employees who may have difficulties navigating the workforce due to cultural differences and systemic biases, amongst other problems. Survey results suggest actuarial companies need to make more of an effort to ensure that these employees have the support needed to excel and thrive in their careers.

The IABA Work Culture survey also included open-ended questions to better understand the needs of its members and what actuarial employers can do to improve their workplaces. Following is a summary of these questions and responses from survey participants:

1. What makes you feel included/supported in your workplace?
   Engagement emerged as the main theme identified in the responses to these questions. Survey participants want to be included in meaningful work that makes them feel like they are a part of a team and contributing to the overall business objectives of their organization.
   Related to engagement, survey participants also want opportunities to voice their opinions and thoughts and for them to be given consideration. Survey participants noted that DEI initiatives and career planning/mentoring make them feel included and supported in the workplace.
2. What do employers need to do/know to better support/advance Black actuaries?
   This question elicited a few key themes. One theme related to advancing Black actuaries is communication. Survey participants noted that expectations for career advancement and promotion should be clearly communicated and standardized. These suggestions can help mitigate bias and favoritism as it relates to the promotion process.
   Another theme identified is DEI. Survey participants believe it's important that employers demonstrate a long-term commitment to DEI to support Black actuaries; it shouldn't be just a fad. To support Black actuaries, participants believe employers should make an effort to understand the obstacles faced in the workplace, such as unconscious bias and non-diverse teams, and actively address these impediments.

3. What are some things you've experienced at your current or past employer that have built retention? Survey participants identified several suggestions that employers could use to retain talent, including:
   - Career assistance — Exam support, rotations/new opportunities and mentorship.
   - Work culture — An actuarial community that exhibits camaraderie among colleagues, conducts team building activities, engages in community service and offers flexibility and support.
   - DEI — Leadership that demonstrates a commitment to DEI, have Black representation in the workplace and support for participation in organizations like IABA.
   - Recognition — Career progression for strong performers and incentives/rewards for outstanding work.
   - Communication — Clear and publicized expectations and competencies.
4. What is one thing you wish your current or former employer knew that would help improve retention? Survey participants provided very insightful responses. A few direct responses include:
   - There is no one-size-fits-all solution for employee engagement. Listen to and take into account individual employee's needs.
   - Leadership should proactively sustain employee morale rather than reacting only when employees are unhappy.
   - Invest in growth and advancement of Black employees.
   - Diversify the experience for employees and provide challenging opportunities.
   - Black representation is extremely important.
   - Communicate with employees, especially one on one.

Conclusion

One of the products of our first Work Culture survey, was the development of the IABA report, "Recommendations for Employers in North America to Increase the Number of Successful Black Actuaries." The intent of these recommendations is to assist employers with building a more diverse, equitable and inclusive work environment. The recommendations are the result of countless conversations with members, sponsors and industry partners, as well as IABA's 25 years of experience addressing underrepresentation in the actuarial profession. To date, this report remains one of IABA's most powerful tools.

Our hope is that with consistent implementation of these recommendations, keeping a pulse on Black actuaries' experiences through our Work Culture surveys and participation in IABA programs and initiatives, we can work together to build a more diverse, equitable and inclusive profession.

Dwayne Husbands is a senior manager in Ernst & Young's insurance and actuarial services practice in New York City. He has served at IABA president since 2020.

ETHICAL ISSUES

Win-Win or Lose-Lose?

Members of the CAS Professionalism Education Working Group write Ethical Issues, the intent of which is to stimulate discussion among CAS members. Therefore, positions are sometimes stated in such a way as to provoke reactions and thoughtful responses on the part of the reader. Responses are welcomed; email ar@casact.org. The opinions expressed by readers and authors are for discussion purposes only and should not be used to prejudge the disposition of any actual case or modify published professional standards as they may apply in real-life situations.

Fagin, FCAS, is a partner at Bumble Actuarial Consulting (BAC). For several years, BAC has been developing the Claims Master 3XB (3XB), a complex claims-management system. The 3XB tracks claims from the time of reporting through settlement and uses predictive modeling and machine learning to help insurers set case reserves based on a claim's characteristics and prior claims that have similar characteristics. The 3XB also will flag claims that may require particular attention due to their complexity or propensity to be fraudulent.

BAC has invested hundreds of thousands of dollars and thousands of hours developing the 3XB. They brought it to market two years ago, but sales were less than expected. It is unclear if the lagging sales are due to inadequate marketing or the 3XB's annual licensing fees. The senior partners are pressuring Fagin to increase sales or find other employment.

Sikes, FCAS, is a consulting actuary at BAC who specializes in reserve opinions. Sikes is working on a reserve opinion for Artful Dodger Insurance Company (ADIC), a small commercial and personal lines insurer located in Mudfog, North Dakota. Fagin has been in discussions with ADIC management over the purchase of the 3XB for the past six months. They were initially hesitant to pay the high price tag, saying the investment was too large for a company their size. Fagin made a presentation that showed the 3XB would more than pay for itself in lower or denied claims dollars in about three years. He feels the presentation was successful and believes they are close to signing a contract.

Sikes has just completed her analysis of ADIC's third quarter loss and loss adjustment expense reserves. Her analysis indicates that ADIC's held reserves are just below the low end of her range of reasonable estimates.

Fagin calls Sikes into his office.

"Sikes, how are you doing on this rainy afternoon? Did you have a good weekend?"

"Um, I'm ok … How are you?" Sikes asks.

"I'm concerned," continues Fagin. "I read your summary of the reserve opinion for ADIC. A deficient opinion? Really? BAC's prior reserve analyses have shown ADIC had adequate reserves for the past five years. What changed?"

Sikes explains, "The deficiency is being driven by adverse development on claims in older accident years. The majority of their book consists of small construction companies, general contractors and artisan insurance, as well as a focus on liability-only personal auto policies. They usually release IBNR reserves after 24 months and any adverse development beyond that they cover with current year IBNR. However, their historical experience shows claims have continued to develop up to 60 months. In the past year, they have seen considerable development on claims from over three years ago, but they have virtually no case reserves for these claims and very little IBNR in these accident years."

Fagin's scowl turns into a grin.

"Interesting. So, they are doing a poor job of managing claims — not settling the big ones soon enough or not setting adequate case reserves on the liability claims. These then come back to bite them in the [expletive deleted], and they have to use current year IBNR to settle them. They could really benefit from the 3XB … maybe even more than I projected."

"I suppose that could be true," says Sikes. "I didn't work on the 3XB, but based on what I know about it, ADIC would probably find it beneficial."

"I'm so glad to hear you say that," exclaims Fagin. "We have the opportunity to do good here. ADIC is close to buying the 3XB, and we can explain that their adverse development is due to poor claims management. This information will probably be what it takes to close the deal."

"But there is a problem," continues Fagin. "We need to sign off on their current reserves as being reasonable. I've been meeting with ADIC's management for months trying to make this sale, and I know how cheap they are. If we tell them they have deficient reserves they will

back away from the sale, even though the 3XB will save them money by helping them manage their claims process. Are you following my train of thought?"

Sikes frowns. "Ummm, not really," she says. "Are you suggesting that I sign off on reserves that I believe to be deficient?"

"How long have you been an actuary?" Fagin asks.

"I've been working as an actuary for 10 years," Sikes says. "I got my FCIA three years ago. I've also been working on U.S. accounts for the last five years."

"Well, I've been doing this for almost 30 years," Fagin boasts, "and I've had my FCAS for over 20 of those years. I've learned actual actuarial work is more nuanced than the 'follow-the-ASOPs-and-Code-of-Conduct-and-all-will-be-well' mantra that the CAS promotes. In the real world, we make decisions that affect our business and careers. This often involves weighing the pros and cons of different courses of action. It's a lot more gray than black and white."

"Let's think about this from that perspective," Fagin continues. "If you opine that ADIC's reserves are reasonable, will they go under next year? They are just below your reasonable range. Could your range be wider than you originally estimated?"

Sikes is confused by Fagin's line of reasoning. "I can't really say with certainty," says Sikes. "I'd have to revisit how I determined my reasonable range."

"Sikes, in your professional actuarial opinion, is there a greater than 1% chance that they go bankrupt next year with their current reserves, yes or no?"

Sikes becomes increasingly uncomfortable by the line of questioning regarding her analysis. "Since I feel like you are forcing me to answer," she says, "I'd have to say I don't believe they will go under next year."

"Great," Fagin says. "So, they'll probably stay afloat with their current reserves, and you also agree that they would benefit from the 3XB. So, I think we have two options:

1. "We can tell them their reserves are deficient, say goodbye to selling them the 3XB, and possibly lose them as a client altogether. They will still have their claims management problems and be on the edge of reserve deficiency. That is a lose-lose scenario.
2. "Or we can keep our client happy by providing a reasonable opinion, make a key sale of the 3XB, fix their structural claims management problem, and bring them into a more sufficient reserve position. This to me is a win-win scenario.

"Which option sounds better to you?"

*****

Dear Readers: Following are some questions for your consideration.

- Should Sikes revisit her analysis to widen the range of reasonable reserves? What factors should she consider?
- Is it Sikes's responsibility to support the recommendation of purchasing 3XB? Why or why not?
- What are Fagin's professional obligations? What are his obligations to his employer?

We would love to hear your views on this scenario. Please submit your responses and comments to ar@casact.org with the subject "Ethical Issues."

Let's Talk about Trade Credit Insurance By MAHESWARAN SUDAGAR

"An uncollected invoice may be the tipping point between a profit and a loss of a business enterprise."

—Something that anyone wanting to purchase this product should know.

Trade credit insurance in its simplest form is business-to-business accounts receivable (AR) insurance protecting the insured (the seller or the policyholder) against the risk of losses arising from a buyer's failure to pay the amounts due to the insured. Accounts receivable is debt created when a seller delivers goods but is awaiting payment by the buyer, like an IOU or a loan. Alternatively, this may also be known as "selling on credit terms," a low-cost form of financing for buyers to boost sales.

In the world of retail trade, the seller ships their products to their customers (buyers) who in turn sell those products in their stores. Buyers typically delay payment 60-120 days — the average time that it takes to move the products off their shelves. Buyers often need this time to generate cash flows to repay the sellers. Imagine a situation where the buyers must pay for all goods in their stores prior to the sales and how difficult that would be in the world of trade. It is also important to note that these transactions are not collateralized, so the seller considers the buyer's repayment history as assurance that the owed monies will be paid in due course.

If all goes as planned, the seller will be reimbursed by the buyers in the time frame stipulated in the contract. However, there could be situations where the buyers do not pay the sellers on time or never at all owing to reasons, such as:

- difficult business situations.
- bankruptcy.
- poor financial management.
- lack of product demands.

Luckily, for sellers, the insurance marketplace has created a product, often termed "whole turnover/multi-buyer, trade credit insurance," to mitigate the risk of not receiving payment in a timely manner.

Each year, a seller could deal with any number of buyers, both those who already have relationships with the seller and those who are new to the seller. A trade credit policy typically provides insurance on named buyers whose credit worthiness has been determined acceptable by the insurer. In addition, the insurer will also offer a discretionary credit limit (DCL) for any unnamed buyers that the seller will deal with during the policy term. The DCL is usually much smaller than the limit offered on the named buyers. Given the lack of information on the unnamed buyers at policy inception, a comparatively low DCL helps shield the insurer against potential high-severity losses while still affording the seller a level of risk protection.

Imagine a situation where the buyers must pay for all goods in their stores prior to the sales and how difficult that would be in the world of trade.

In addition to the DCL, there are potentially other policy features put in place to share the loss with the insured, such as:

- an aggregate deductible.
- 10%-20% coinsurance.
- individual buyer deductibles.

Sellers with a strong balance sheet and a cash surplus may choose to "stand on their own cash flows," meaning they would not use a bank for their financing needs but still use trade credit insurance as a mechanism to ensure they are made whole in the event of a buyer default. However, many sellers require financing support or a revolving line of credit from a bank to facilitate smooth operations. Because of the time lag in collecting payments from their buyers, a seller often establishes a financing facility from a bank to maintain manufacturing the product lines, pay for cost of goods and the like. In turn, these banks may require proof of trade credit insurance on the seller's accounts receivable as a precursor to providing financing. In this way, a seller with trade credit insurance can secure bank financing at terms that are more attractive.

In recent years, the basic trade credit policy has evolved to offer additional coverage that can include:

- liquidity protection.
- capital relief.
- increased transactional capacity.
- policy compliance.
- regulatory requirements.
- residual value covers on leasing arrangements.
- export credit.

Some of the larger deals have been completed on a syndicate basis, where multiple carriers take a share of the overall limits.

When underwriting a potential insured, the insurance company typically considers the industry, previous loss history, current aging of receivables, internal credit practices of the firm, geography/political situation, macroeconomic environment and the financial standing of the buyers. An understanding of the buyers' financial strength is paramount, so insurers typically assess financial strength using in-house risk rating models, as well as financial metrics from external agencies, such as S&P, Moody's, Fitch and D&B DRS Score. Based upon these metrics, a risk score is produced that is used to rate the exposure. It's essential that the exposure represented by the group of buyers is fully analyzed and quantified from a risk perspective. A weighted average risk score determines the final insurance premium paid. In the United States, this is typically an admitted product requiring rate filings; however, there are instances of trade credit insurance being non-admitted.

For an illustration, a potential mapping of the risk scores to risk assignment and the expected probability of default are shown in Figure 1.

Figure 1. Risk Scores to Risk Assignment Mapping

Risk Score	Agency Rating
1	AAA to A+
2	A to A-
3	BBB+ to BBB
4	BBB- to BB+
5	BB to BB-
6	B+ to B
7	B-
8	CCC to CCC-
9	CC to CC-
10	C to D

Rating	Prob of Default
AA- to A-	0% to 0.05%
BBB+	0.10%
BBB	0.15%
BBB-	0.25%
BB+	0.3%
BB	0.5%
BB-	1.00%
B+	2.00%
B	3.0%
B-	7.0%
CCC/C	30.0%

The expected loss cost of this product hinges on three components: exposure at default (EAD), probability of a customer default (PD) and loss given default (LGD). For example, the exposure at default can be determined by actively monitoring the in-force portfolio or using a long-term usage rate of 60% of limit capacity, or both. The probability of default, a key part in this equation, can come from internal/external risk rating models as in the example shown in Figure 1. The LGD is an amalgamation of policy features and any potential recoveries. And it can range anywhere from 20% for a well-collateralized portfolio to 100% for a fully uncollateralized portfolio, offsetting any coinsurance or deductibles.

Expected Loss Cost = EAD * PD * LGD.

To summarize, trade credit insurance has the potential to address these three major needs:

- Mitigate risk of nonpayment such as bankruptcy/protracted default or cross border risks.
- Increase sales by winning new customers and/or extending more competitive terms.
- Enhance financing such as improved borrowing terms and quicker cash flow that are required by banks as additional protection or capital relief.

The loss ratios for a whole of turnover business typically run in the low- to mid-50s and offers an attractive return for an insurance carrier. The one caveat to note is the marginally higher capital requirements from a balance sheet perspective, owing to the uncollateralized nature and the proneness to react to economic peaks and troughs. The loss ratios tend to be much more favorable in better economic conditions and worse during economic recession or a slowdown.

With a global market size of $7.0 billion (U.S.'s share is $1 billion), the potential for this product line will continue to evolve and offer a good diversification benefit for global insurance carriers!

Maheswaran Sudagar, FCAS, is senior vice president, lead actuary, for Crum & Forster's surety, credit and program solutions.

IN MY OPINION By ALICE GANNON

A Lesson from History

"More and more, I tend to read history. I often find it more up to date than the daily newspapers."

—Joe Murray

This past summer I first became aware that the CAS Board, wittingly or not, has relaxed its customary diligence in keeping close contact with the membership on important matters. When the vote for major changes to the CAS constitution and bylaws were presented for a vote without the usual extensive vetting with the membership that such a change has always received, the measure failed. This realization made me look closer at other activity that might be concerning and I discovered a lot of special activity during the past two to three years on diversity and inclusion. Perhaps I missed it because when I saw the words "diversity and inclusion" in CAS communications, I just assumed the CAS was continuing with the work it has been engaged in for several decades. That work was aimed at increasing both the awareness of our profession and the accessibility of the credentialing process. I regret that I did not pay closer attention at the time. Had I known about the DE&I initiative that was being considered by the CAS Board, I surely would have weighed in with my views. But, better late than never.

I think we can learn from the historical example of gender diversity progress.

I first entered the actuarial profession in the mid-1970s. At that time, there was a very small percentage of CAS members and students taking exams who were women. I remember being gratified to read and hear that the CAS leadership was concerned about this lack of gender diversity and were looking for things the CAS could do to improve it. I believed then, and still believe today, that was fully appropriate within the proper constraints, such as no lowering of standards for entry based on gender. To do that to achieve some gender diversity goal would have been insulting and wrong and to my knowledge was never considered at all.

Today a very substantial percentage of members of the CAS and CAS students are women. Not 50% yet, but enough that their perspective is included and their voices heard in just about everything the CAS does. In fact, today women make up the majority of the CAS Executive Council. Women are definitely an "included" part of the CAS. And I believe that has made the CAS better.

But did anything the CAS do make this large improvement in gender diversity and inclusion happen? I am sure some of the efforts did make a difference for some individuals and were not a waste of time. But I am also sure that the large increase in percent of women in the CAS is *not* due to anything that the CAS did.

The very positive change in gender diversity within the CAS was the result of changes at a much more fundamental level within our society at large. It is a result of lots of effort by many, many people. The progress for women's inclusion within all aspects of society at large has been a long, hard fight. Remember, women did not gain the clear constitutional right to vote in the U.S. until 50 years *after* Black men did and several years after the CAS was formed. I can find no reference to the CAS advocating for women's suffrage. Indeed, to have done so would have violated the CAS constitution. And as societal attitudes shifted in a positive direction with regard to women's rights, the CAS was not a force in the enacting of legislation to formalize women's rights nor did the CAS provide any amicus briefs in support of court cases that centered around gender equality issues.

The increase in the percent of women in the CAS is far from unique. There has been a similar increase of women in most of the professional fields previously almost exclusively the domain of men — doctors, lawyers, architects, engineers, accountants, etc., — which supports the case that this progress was not something the CAS achieved through its own actions. It was the change to societal fundamentals, caused by many groups and individuals, from which the CAS benefited.

I would suggest that the same will be true of the CAS's desire and need to increase its diversity in other areas. I believe history tells us that major improvement in diversity within the CAS will depend on more fundamental societal work that should not be within the purview of the CAS because it really cannot be achieved by the CAS.

The CAS should continue to work hard and creatively to bring awareness of the great casualty actuarial profession to all groups of people and ensure that there is ready access to our credentialling process for all. But let's not delude ourselves that the CAS can overcome, through its own efforts, and correct the fundamental injustice that exists within our society at large. To dedicate significant resources to this would be a major distraction from our important work "to advance the body of knowledge of actuarial science applied to property, casualty and similar risk exposures; to establish and maintain standards of qualification for membership; to promote and maintain high standards of conduct and competence for the members; and to increase awareness of actuarial science."

We must not follow the dangerous example of Don Quixote, pursuing what we believe to be a noble cause and end up damaging our ability to make a very valuable contribution to society for which the CAS was formed. We risk damaging our credibility and diverting valuable resources away from our purpose as a professional organization. Don Quixote is famous for his monumental failure. That is not the legacy I wish for the CAS. ●

Alice Gannon, FCAS, was elected CAS president in 2000. She retired from USAA in 2016.

IT'S A PUZZLEMENT By JON EVANS

Forecasting the Future of the CAS Nonce

So far, in response to the puzzle "Proof of Crypto Mining Work" from the November-December 2021 issue, the nonce with the most leading 0s in binary form, when appended to the text "Casualty Actuarial Society" and run through the hash function SHA-256, was submitted by Mike Convey. His nonce of 1ff8640245 produces a hash with 42 leading binary 0s. We can call the number of leading binary 0s in the hash the *strength* of the nonce. In turn, we can call the highest strength nonce known to date, the *strength of the CAS nonce*. Of course, we can call this strongest nonce to date *the CAS nonce*.

The challenge this month is to forecast the strength of the CAS nonce in future years, from 2023 as far into the future as you wish. Forecasts for the years 2100, 2200, … are welcome. Please include details of your model assumptions, calculations, etc.

To add to the fun, readers are also encouraged to submit other related items, such as:

- Best ways to automatically track and record the strongest nonce in the future. If you are up to it, submit something like the code for a webpage (probably with JavaScript) that would allow online entry of new submissions, along with automatic verification and recording when a new stronger CAS nonce is submitted.
- Special recognition or prizes that should be given each time a stronger CAS nonce has been submitted.
- A special logo, avatar or coat of arms for the CAS nonce.
- Original and highly entertaining fictional stories or comics, of any genre, set in the future and featuring the strength of the CAS nonce as a central plot element.

(Note: Apologies to readers for the continuing delay in publishing a solution to the puzzle "A Game of Coins" from the January-February 2022 issue. It has not been forgotten. This one is just a bit challenging to write up.)

An Equitable Pass Curve

Professor Mannboltz will model the situation to maximize the entropy of the respective distributions of scores for groups G1 and G2, within the constraints of the given information. First, he will summarize the constraints:

- Scores range continuously in the interval [0, M].
- 10% of all test takers pass with score in the interval [P, M].
- 80% of all test takers are from G1 and 20% are from G2.
- 2% of the 10% who pass belong to G2.

The implied special constraints for the two groups are:

- (98%*10%)/80% = 12.25% of G1 have scores in the interval [P, M].
- (2%*10%)/20% = 1% of G2 have scores in the interval [P, M].

Consequently, the maximum entropy distributions for the two groups will each be piecewise uniform in two pieces split at the pass score of P:

- The probability density for G1 will be 87.75% / P for scores in the interval [0, P) and 12.25% / (M-P) for test scores in the interval [P, M].
- The probability density for G1 will be 99% / P for scores in the interval [0, P) and 1% / (M-P) for test scores in the interval [P, M].

For an equitable outcome, it is necessary that 10% of each group pass. Assuming the maximum entropy distributions above:

- The 12.25% of G1 that pass needs to be reduced by 2.25%. In the interval [P . P + (2.25% / 12.25%) (M-P)) there will be 2.25% of G1. So P1, the pass score for G1, should be set equal to P + (9 / 49) (M-P) to exclude an extra 2.25% of G1 from the passing group.
- The 1% of G2 that pass needs to be increased by 9%. In the interval [P – (9% / 99%) P, P) there will be 9% of G2. So, P2, the pass score for G2, should be set equal to (10 / 11) P to include an extra 9% of G2 in the passing group.

What might this look like with some specific example numbers? Suppose the initial passing score was 70 out of 100. Members of G1 would need to score about 75.5 or higher to pass, while members of G2 would only need to score about 63.6 or above to pass, for an equitable pass curve.

John Berglund also submitted a solution.

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

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